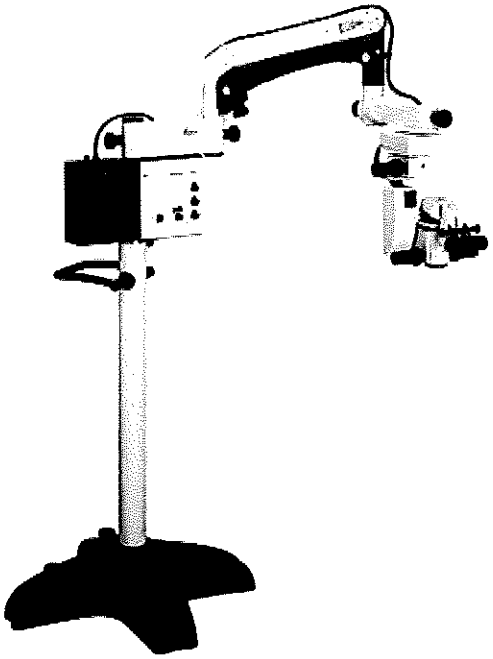

Leica M501

Installation Instructions

10 711 784 – Version B

Leica

MICROSYSTEMS

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General safety regulations

In addition to instructions of use and assembly, these installation instructions also provide important safety notes.

Be sure to read the Installation Instructions completely and carefully before assembling and operating the product.

Intended use

- The Leica M501 surgical microscope is an optical instrument for improving the visibility of objects through magnification and illumination.
- It can be applied for observation and documentation and for human and veterinary medical treatment.
- The Leica M501 surgical microscope may be used only in closed rooms and must be attached to a strong ceiling.
- The Leica Telescope Mount provides ergonomic positioning of medicinal instruments in the working environment.

Directions for the person responsible for the instrument

- Ensure that the surgical microscope is used only by persons qualified to do so.
- Carry out regular inspections to make certain that the authorized users are adhering to safety requirements.
- When instructing new users, do so thoroughly and explain the meanings of the warning signs and messages.
- Assign individual responsibilities for starting, operating and servicing the surgical microscope and monitor the observance of these responsibilities.
- Only use the Leica M501 surgical microscope if it is free of defects.
- Inform your Leica representative or Leica Microsystems (Schweiz) AG, CH-9435 Heerbrugg, immediately if you detect a product defect that could potentially cause injury or harm.
- The influence on other devices by the Leica M501 surgical microscope has been tested in accordance with EN 60 601-1-2. The system passed emissions and immunity test. The standard preventive measures and safety regulations pertaining to electromagnetic and other radiation must be observed.
- The owner or operator shall be held liable for the function of the system if the system has been assembled incorrectly by individuals who do not belong to Leica Microsystems (Schweiz) AG.

Directions for the operator of the instrument

- If you use accessories made by third-party manufacturers with the Leica M501 surgical microscope, be sure that each such manufacturer confirms the safety-engineering, harmless usability of the product and observe the product's user manual.
- Follow the instructions described in these installation instructions.
- Follow directions provided by your employer regarding work organization and safety.
- Modifications may not be made to the Leica M501 surgical microscope.

Disposal

- The product is to be disposed of in accordance with current local country regulations.

Symbols used in these Installation Instructions

The symbols used in these Installation Instructions are defined as follows:

Warning
This indicates a hazardous situation or unintended use which could result in serious injury or death.

Caution
This indicates a hazardous situation or non-intended use which could result in minor or moderate injury, but possibly considerable material, financial or environmental damage.

Useful information: Intended to help the user use the product correctly and efficiently.

⇒ Action required: This symbol indicates that you need to perform a specific action or series of actions.

Receiving inspection/delivery inspection

Damaged products decrease operational safety.
Using damaged products can lead to serious injury.
Inspect the packaging and products for shipping damage:
- The transport container is undamaged.
- Delivery is complete according to the order file.
- Optional device accessories are complete according to order documents.
- User Manual is present.
- All components are present according to the schematic diagram.

If any product components are damaged, have the Leica service workshop inspect the system before putting it into operation.

Directions for the assembly

- The auxiliary frame may be assembled only by an authorized technical engineering company.
- The ceiling mount may be assembled only by authorized technicians.
- The electrical supply may be connected only by an electrotechnical company.

Safety instructions in these Installation Instructions

Warning
Danger of crushed fingers!
The weights are heavy.
⇨Always hold the weights by their recessed grips when lifting them.

Warning
If the swinging arm falls, it can crush and sever and cause material damage.
The swinging arm is very heavy and must be raised very high during installation.
⇨Use two persons to attach the swinging arm.

Warning
The ceiling mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed in ceilings that do not meet the requirements in the specifications.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Warning
The ceiling mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed if additional weight is applied.
⇨Never hang any additional third-party products on the ceiling mount.

Caution
⇨Tighten all screws without using excessive force.
⇨Set the torque spanner to the specified torque. When the set torque is achieved (i.e. when you hear a clicking sound), stop tightening.

Warning
The ceiling mount can loosen from the ceiling and cause serious injury.
Completely separating the reinforcements hooks weakens the concrete ceiling.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Warning
Coming in contact with the ceiling mount can cause bodily injury.
Faulty electrical installations provided by the customer decrease operational safety.
⇨Electrical installations provided by the customer must meet all current local country regulations.

Warning
The swinging arm can loosen from the ceiling mount and cause serious bodily injury.
⇨Tighten the screws sufficiently.
⇨Each time a screw is tightened, the weight of the swinging arm must be shifted to the opposite screw.

Caution
Screws can loosen!
⇨When assembling the distance rings and the swinging arm, never use anything but the Loctite-treated screws provided.

Caution
Assembling the ceiling mount without a rotational lock device allows rotation of more than 360°.
Electrical cables can become severed!
⇨Install the rotational lock device.

Warning
Danger of fatal electrical shock!
⇨Electrical connections should only be performed by trained electricians.

Caution
Possible damages to the telescope!
⇨ Use only the supplied screws M3 x 5 to secure the hose coupling support.

Preparatory work

☞ Prepare and arrange the tools listed below before you begin assembling the Leica M501 surgical microscope.

☞ Some tasks require two people.

Accessories supplied

- All screws and nuts

Tools

⚠ **Caution**
- ⇨Tighten all screws without using excessive force.
- ⇨Set the torque spanner to the specified torque. When the set torque is achieved (i.e. when you hear a clicking sound), stop tightening.

- Hexagon socket wrench (size 19)
- Allen keys (3 mm, 4 mm, 5 mm, 6 mm)
- Flathead screwdrivers (sizes 3 and 5)
- Philips screwdrivers (sizes 0 and 1)
- Side-cutting pliers

Assembly material

- Cable ties
- Cable-tie holders

Assembly

Complete base and column

Warning
Danger of crushed fingers!
The weights are heavy.
⇨Always hold the weights by their recessed grips when lifting them.

⇨Place the four weights (1) into the base plate (2) using the recessed grips (Figures 1 and 2).

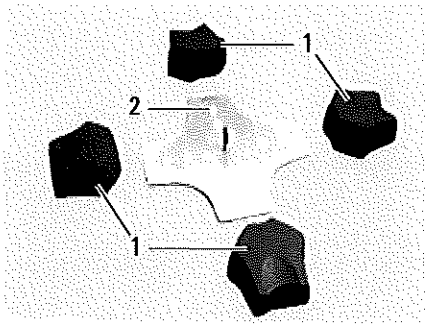


Figure 1

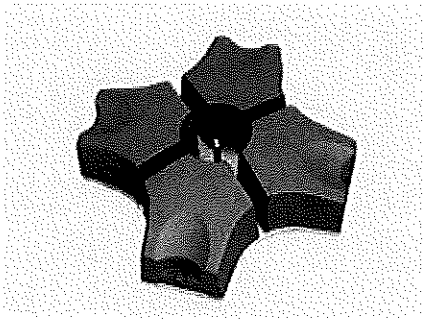


Figure 2

⇨Place the base cover (3) over the weights (Figure 3).

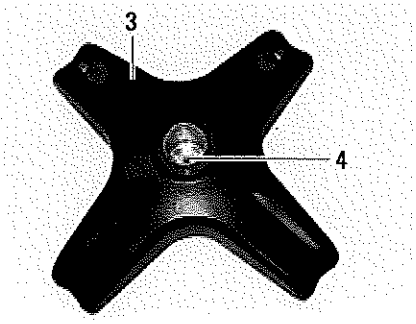


Figure 3

⇨Screw the hexagon nuts onto the bolts (4) and tighten them (Figures 3 and 4).

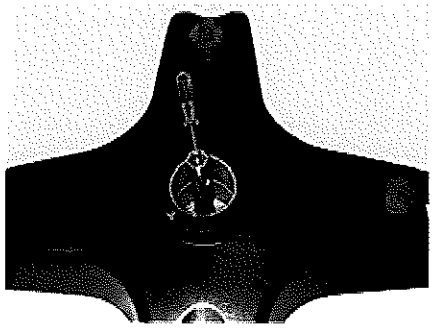


Figure 4

⇨Insert the column (5) into the base opening (Figure 5).
⇨Tighten the Allen screw (6).

The arrows on the column must align with the arrows on the base cover (Figure 5).

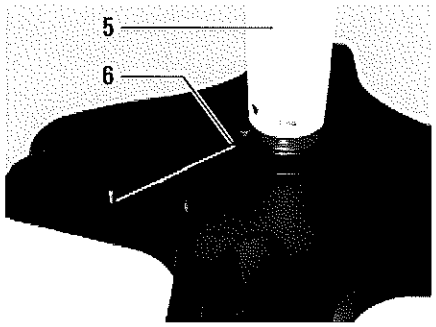


Figure 5

Complete swinging arm

Warning
If the swinging arm falls, it can crush and sever and cause material damage.
The swinging arm is very heavy and must be raised very high during installation.
⇨Use two persons to attach the swinging arm.

⇨Set the swinging arm (1) onto the column (Figure 1).

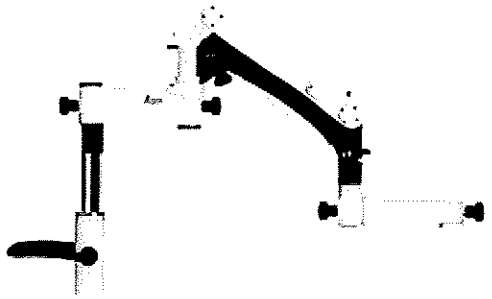


Figure 1

⇨Screw the swinging arm in place using four Allen screws (2) (Figure 2).

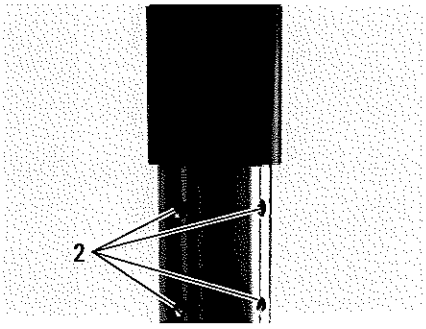


Figure 2

Grip handle

⇨Install two flanges (2), each with two Allen screws (1), onto the column (Figure 1).

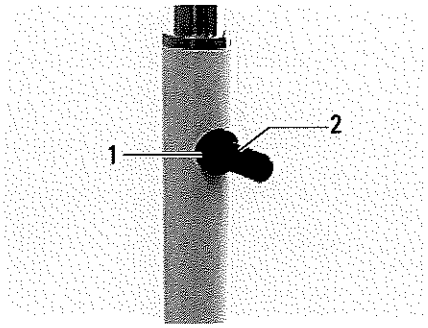


Figure 1

☞ The small through holes (3) in the flange must point toward the brakes (4) (Figure 2).

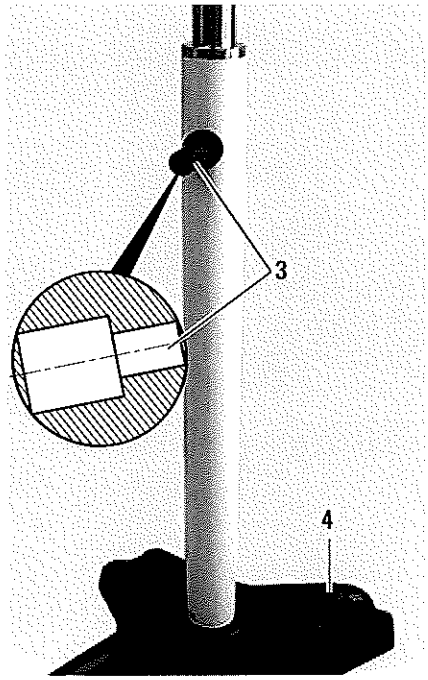


Figure 2

⇨Install the grip handle (5) with two Allen screws (6) onto both flanges (Figure 3).

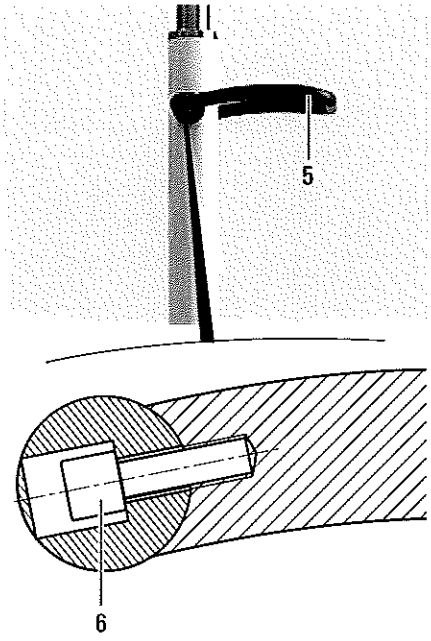


Figure 3

Control unit/lamp housing

☞ To avoid damaging the rotary knobs, never unscrew the back panel of the control unit/lamp housing when it is in a lying position.

⇨Unscrew the back panel (2) of the control unit (Figure 1).

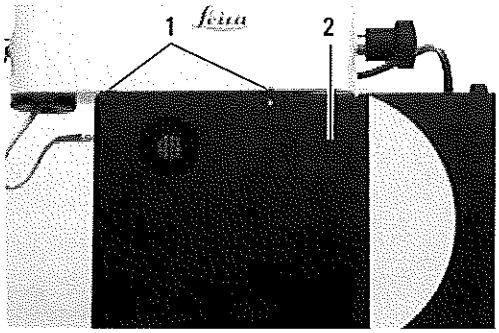


Figure 1

⇨Push the control unit onto the dovetail guide (1) on the swinging arm.
⇨Screw the control unit onto the dovetail guide using four screws (3) (Figure 2).

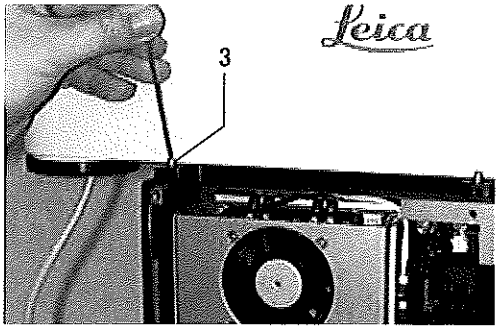


Figure 2

⇨Screw the back panel of the control unit back on.
⇨Plug the fiber-optic light guide (4), CAN-bus cable (5) and power supply cable (6) into the control unit/lamp housing (Figure 3).

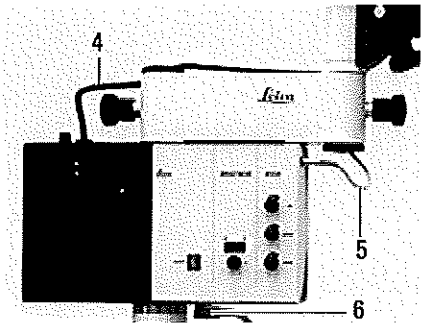


Figure 3

⇨In order to keep the power cable (6) plugged into the control unit, the cable has to be fixed with cable tie and cable tie holder (7) (Figure 4).

Figure 4

XY-unit (optional)

Attach the XY-unit to the tilt head

☞ Pay attention to the installation position of the XY-unit relative to the tilt head. The socket (2) on the XY-unit for the CAN-bus plug must be positioned as illustrated in Figure 1 relative to the tilt head (3).

➪Screw the XY-unit to the tilt head (3) using three screws (1) (Figure 1).

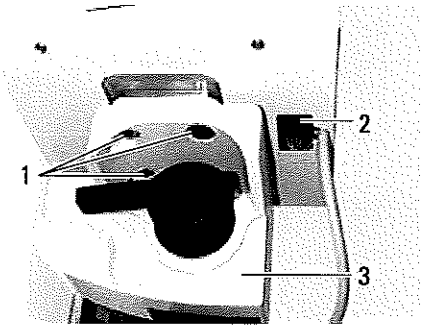


Figure 1

Attach the XY-unit with the tilt head to the rotatable joint

☞ Pay attention to the installation position of the XY-unit relative to the rotatable joint. The arrows (Figure 2) must be positioned on the same side.

➪Fasten the XY-unit and tilt head to the rotatable joint using four screws (4) (Figure 2).

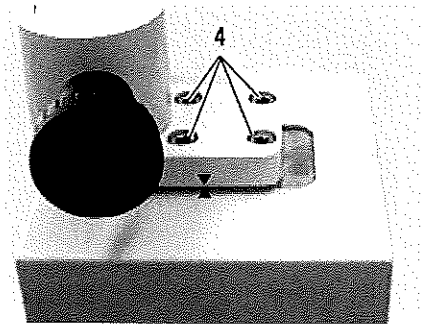


Figure 2

☞ Pay attention to the installation position (Figure 3).

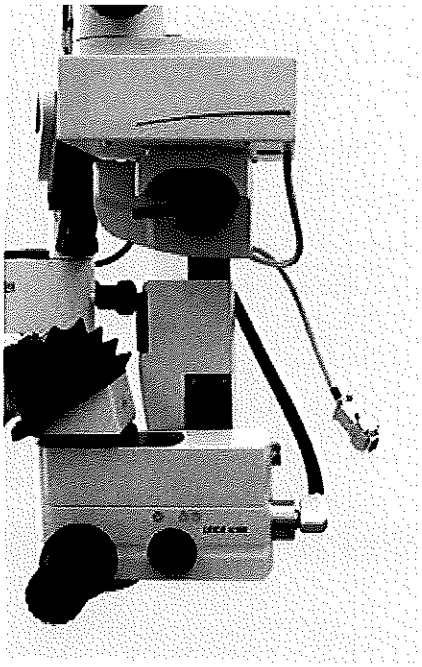
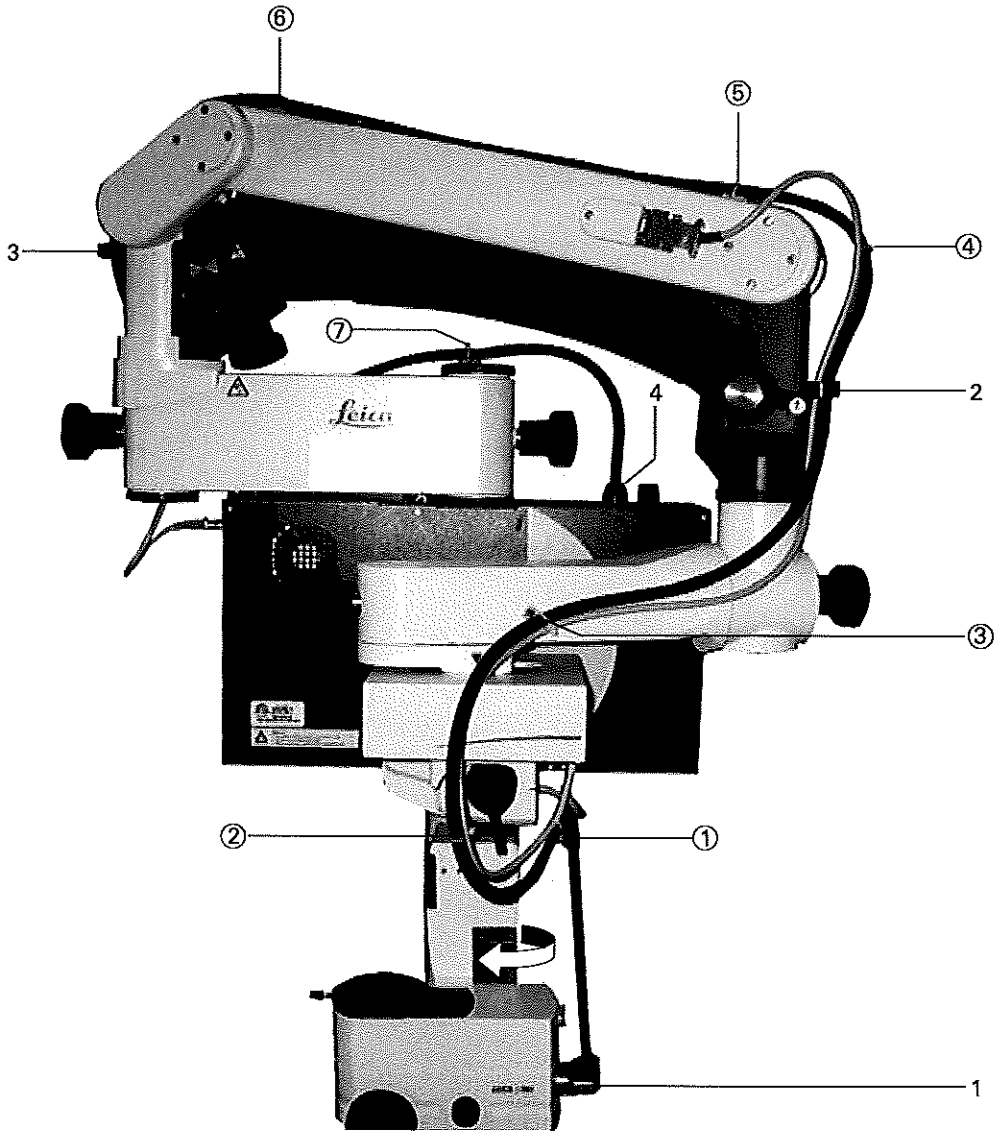


Figure 3

Cabling

⇨Turn the XY-unit clockwise as far as it will go.
⇨Insert the fiber-optic light guide in the optics carrier (1).
⇨Affix the fiber-optic light guide and CAN-bus cable using cable ties in the order ① to ⑥.
⇨Hang the fiber-optic light guide and CAN-bus cable into the cable holders (2).
⇨Feed the fiber-optic light guide through the guide (3) and attach it to the red position at ⑦ using the cable tie provided.
⇨Insert the fiber-optic light guide into the control unit (4).



⇨Insert the CAN-bus plug (1) into the XY-unit (optional) (Figure 1).

Checking the movement of the microscope

⇨Hold the microscope by the handles (2) and carefully turn it in the direction indicated by the arrow until it stops (Figures 1 and 2).
Make sure the fiber-optic light guide and the CAN-bus cable have sufficient play.

If necessary:

⇨Loosen the cable, increase the size of the loop and reattach the cable using cable ties.

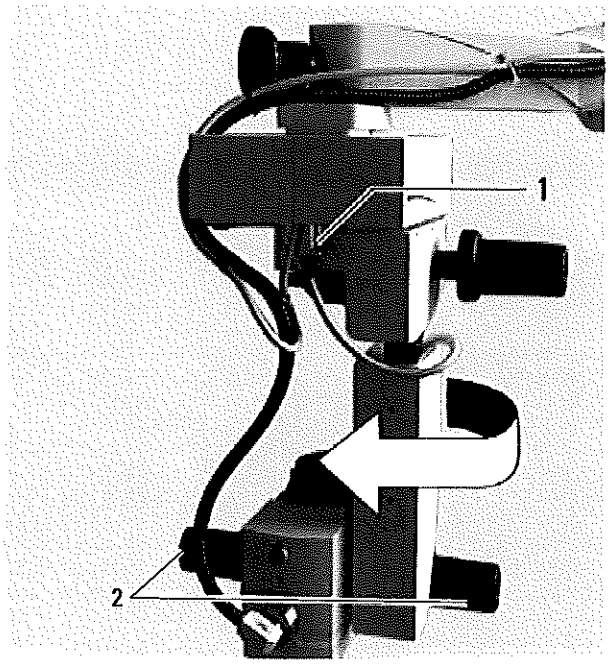


Figure 1

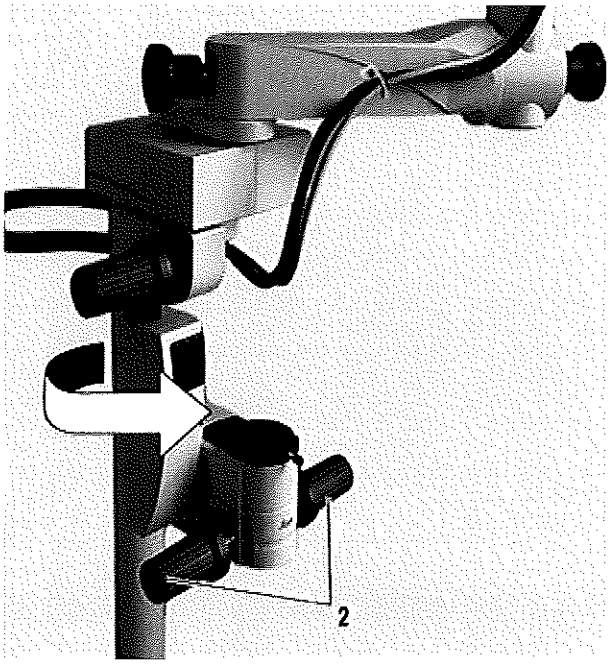


Figure 2

Disassembly

⇨Disassemble the Leica M501 surgical microscope in the opposite order in which it was assembled.

Starting up

Preparatory work

⇨Check for correct seating of all parts.
⇨Connect the Leica M501 surgical microscope to the power supply and switch on the power switch (4) (Figure 1).
⇨Balance the swinging arm (refer to the User Manual for the Leica M501 surgical microscope).

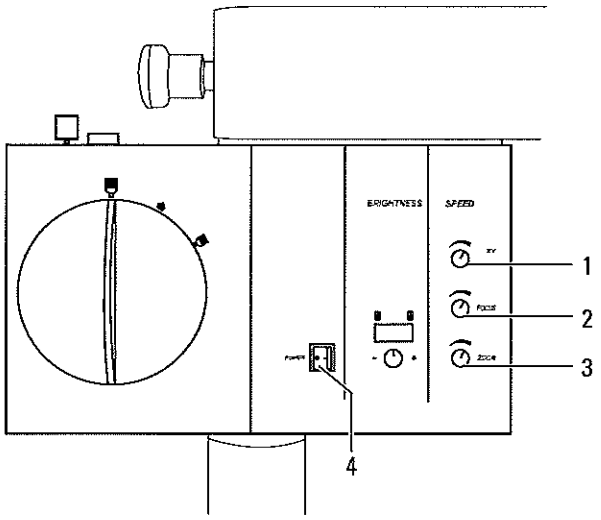


Figure 1

Checking components and functions

Zoom, focus and XY-unit (optional)

⇨Using the hand or footswitch, activate the zoom (7), focus (6) and XY-unit (5) (refer to the User Manual for the Leica M501 surgical microscope) (Figure 2).

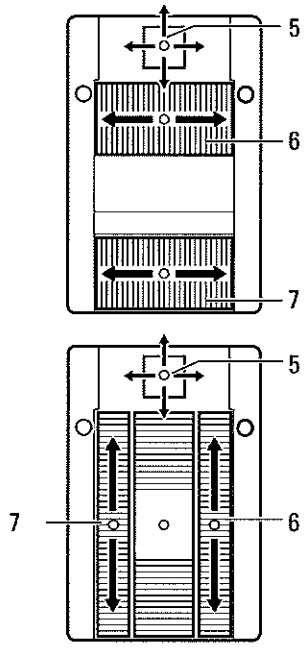


Figure 2

⇨Adjust the speeds for focus (2), zoom (3) and XY-unit (1) at the control unit/lamp housing (Figure 1).
⇨Switch the + and – movement directions of the XY-unit (refer to the User Manual for the Leica M501 surgical microscope).

If you cannot carry out a function:
⇨Check the plug connection of the hand or footswitch to the control unit/lamp housing.
⇨Check the plug connections of the CAN-bus cable at the control unit/lamp housing, the swinging arm and the XY-unit.

Illumination

⇨Adjust the brightness of the main illuminator using the regulating knob (1) (refer to the User Manual for the Leica M501 surgical microscope).
⇨Turn the quick-change lamp mount (2) to the "Auxiliary Lamp" position (refer to the User Manual for the Leica M501 surgical microscope).

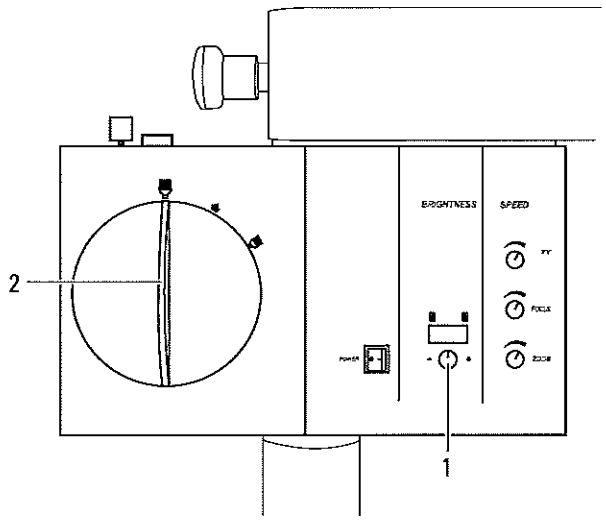


Figure 1

If you cannot carry out a function:
⇨Check whether the quick-change lamp mount is correctly locked into either the "Main Lamp" or "Auxiliary Lamp" position.
If necessary:
⇨Change bulbs.

Technical data

Ceiling specifications

Ceiling load capacity: at least 6000 N/m² *)
Concrete strength: at least 2000 N/m²
Strength class: at least B20

*) At a concrete strength of 2000 N/cm², a ceiling with a thickness of 160 mm yields a ceiling load capacity of 6000 N/m².

⚠ **Warning**
The ceiling mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed in ceilings that do not meet the requirements in the specifications.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Weight

The total weight of the ceiling mount and surgical microscope is 200 kg (static).

⚠ **Warning**
The ceiling mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed if additional weight is applied.
⇨Never hang any additional third-party products on the ceiling mount.

Preparatory work

☞ Prepare and arrange the tools listed below before you begin assembling the ceiling mount.

☞ Some tasks require two people.

Tools

⚠ **Caution**
⇨Tighten all screws without using excessive force.
⇨Set the torque spanner to the specified torque. When the set torque is achieved (i.e. when you hear a clicking sound), stop tightening.

- Drill hammer
- Drill bit ∅ 10 mm
- Drill bit ∅ 18 mm
- Ring spanner, SW 17 mm
- Ring spanner, SW 24 mm
- Torque spanner
- Socket head wrench
- Special socket wrench, article no. 430 415
- Hammer
- Spirit level

Assembly material

- Two HILTI segment anchors HSA M10 x 90
- Four HILTI heavy-load anchors HSL-3-B M12/25

Positioning recommendations

The recommended position of the Leica Mini Mount is above the center of the operating table, if possible in combination with the OP ceiling lighting.

Assembly

Fastening system

Warning
The ceiling mount can loosen from the ceiling and cause serious injury.
Fastening systems that are not suited for this fastening type reduce the operational safety.
⇨Have an equivalent fastening system selected from an authorized technician.

The HILTI heavy-load anchor HSL-3-B for zones subject to tensile and pressure forces can be used for fastenings in normal concrete having a strength class of at least B20.

⇨Mark the guide holes (1) at the determined mount position (Figure 1).
⇨Drill the guide holes ∅ 10 mm and 100 mm deep.
⇨Clear the holes of drilling dust using a hand bellows.

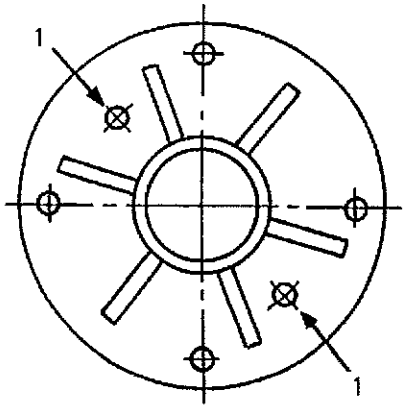


Figure 1

⇨Align the mounting bracket over the holes.
⇨Push the HILTI segment anchor HSA M10 x 90 through the guide hole.
⇨Lightly tap the anchor into the hole using a hammer (Figure 2).

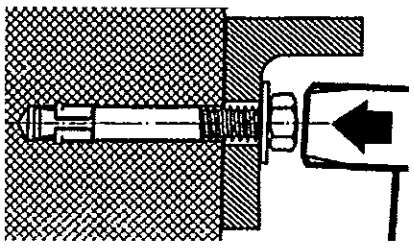


Figure 2

Place the nut flush to the end of the threading to protect the threading while tapping the anchor in!

⇨Tighten the nut to spread and brace the anchor (Figure 3).

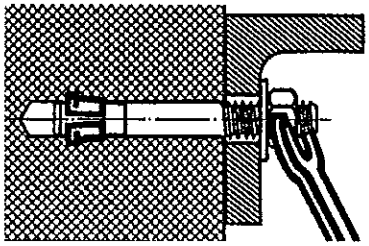


Figure 3

⇨Install the second auxiliary fastener.

Final assembly with HILTI heavy-load anchor HSL-3-B M12/25

The HILTI heavy-load anchor HSL-3-B can be used for fastenings in reinforced and non-reinforced concrete having a strength class of at least B20.

The HILTI heavy-load anchor HSL-3-B is a mechanically braced steel anchor with optically controllable initial tension which can take immediate load.

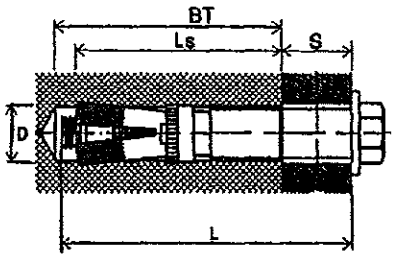


Figure 4

L = anchor length
Hd = hole depth
Id = insert depth
H = fastening height
D = hole ∅ = outer anchor ∅

There are three precision shear elements found in the red shear cap. Once the necessary torque has been applied using a standard ring spanner, the red hexagon cap shears off. The green filling that is uncovered and now visible on the screw head indicates that you have reached the necessary tension and the anchor will now carry the permissible load.

Installation data for HILTI heavy-load anchor HSL-3-B M12/25 in mm

D	hole ∅ = outer anchor ∅:	18
$H_{max.}$	max. fastening heights:	25
Hd	hole depth:	120
L	anchor length:	137
SW	shear cap spanner width:	24

⇨Drill hole ∅ 18 mm and 120 mm deep (Figure 1).

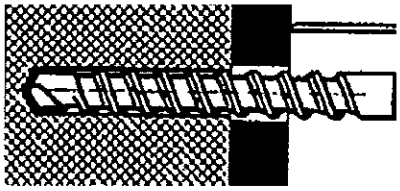


Figure 1

⇨Clear the holes of drilling dust using a hand bellows (Figure 2).

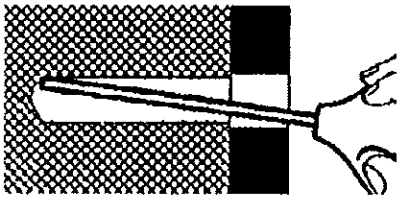


Figure 2

⇨Lightly tap the anchor into the hole flush to the plate using a hammer (Figure 3).

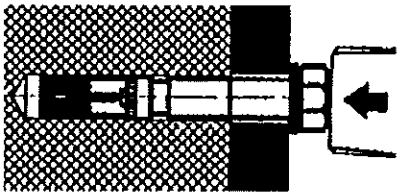


Figure 3

☞ The anchor sleeve splits suddenly!

⇨Tighten using a ring spanner until the red shear cap shears off.
The anchor is now tensioned with the necessary torque (Figure 4).

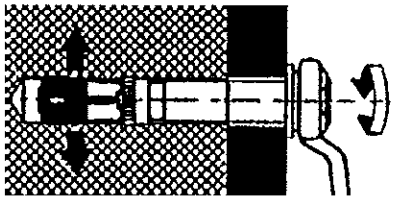


Figure 4

☞ Do not damage the green filling (1).

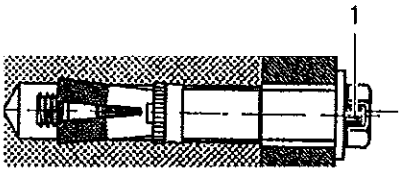


Figure 5

Green filling (1) is not damaged: the anchor can carry the permissible loads.
Green filling (2) is damaged: contact a HILTI representative immediately.

Mounting bracket assembly

Warning
The ceiling mount can loosen from the ceiling and cause serious injury.
Completely separating the reinforcements hooks weakens the concrete ceiling.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Warning
Coming in contact with the ceiling mount can cause bodily injury.
Faulty electrical installations provided by the customer decrease operational safety.
⇨Electrical installations provided by the customer must meet all current local country regulations.

⇨Install the mounting bracket as illustrated in Figures 1 to 3.

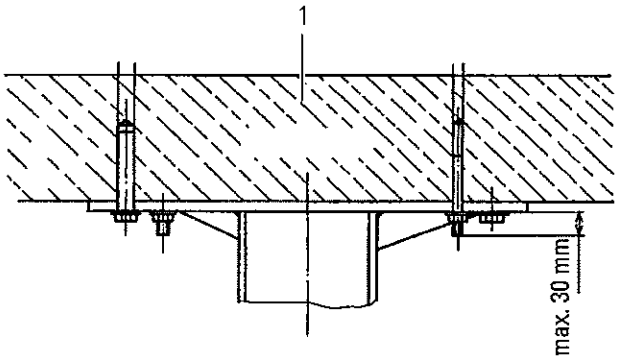


Figure 1

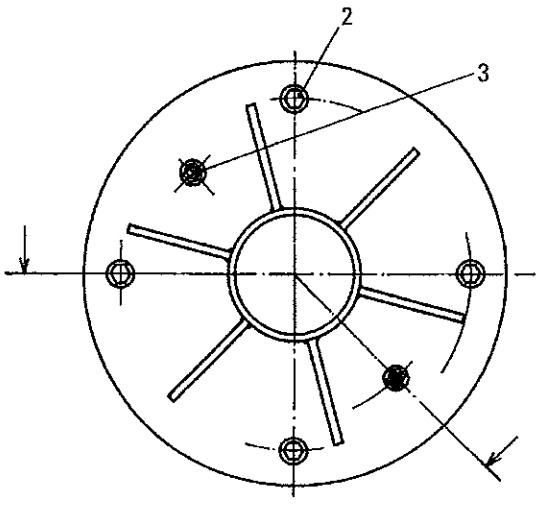


Figure 2

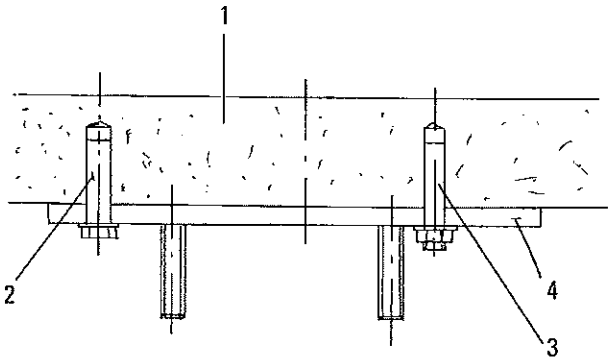


Figure 3

1 Concrete ceiling
2 HILTI heavy-load anchors HSL-3-B M12/25
3 HILTI segment anchor HSA M10 x 90
4 Ceiling plate

Assembling the ceiling mount onto the mounting bracket or ceiling plate

Detail A (Figs. 1 and 2):
⇨Install six screws (A) with cup springs (B) and nuts (C) on the mounting bracket (1).
⇨Screw on six nuts (D).
Leave a gap of about 20 mm.
⇨Install the ceiling mount (2) with six nuts (G) and six cup springs (E) and (F) at the console.
The torque of nuts C, D and G is 60 Nm.

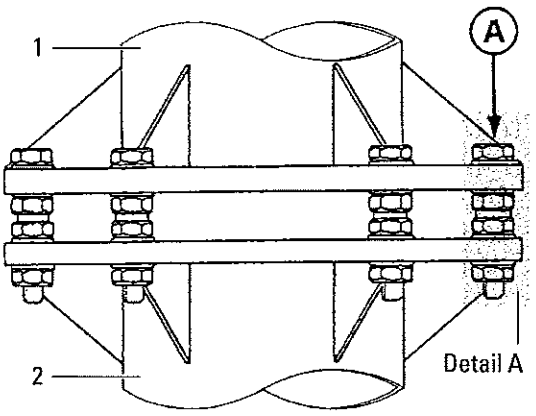


Figure 1

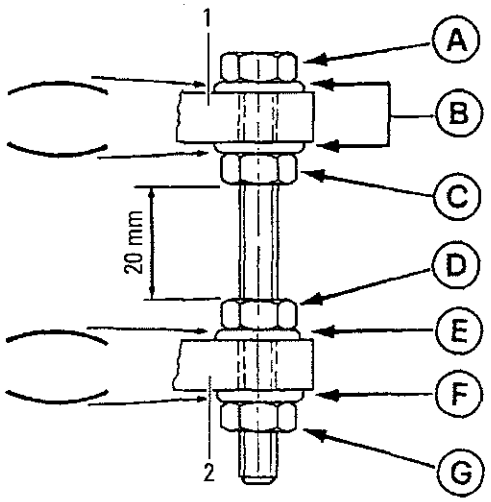


Figure 2 (Detail A)

Detail B (Figs. 3 and 4):
⇨Screw on six nuts (D).
Leave a gap of about 20 mm.
⇨Install the ceiling mount (2) to the ceiling plate (3) with six nuts (G) and six cup springs (E) and (F).
The torque of nuts D and G is 60 Nm.

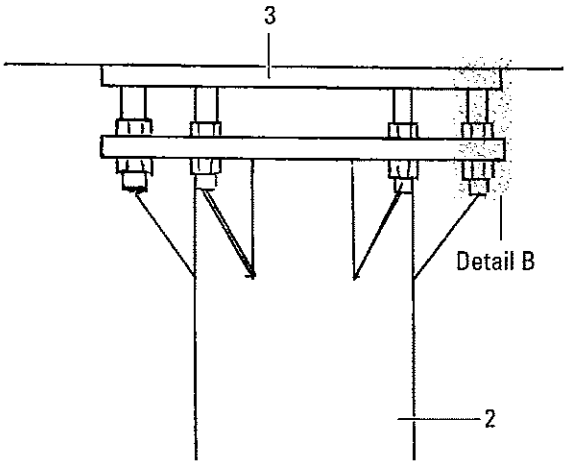


Figure 3

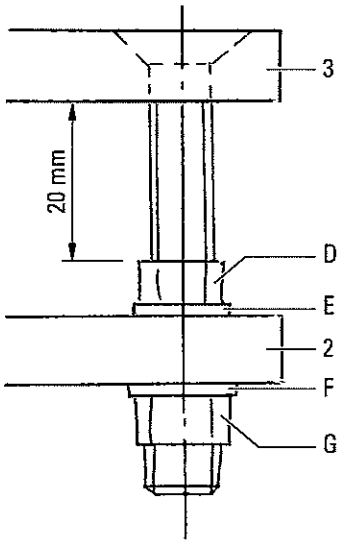


Figure 4 (Detail B)

Leveling the ceiling mount vertically

⇨Hold a level (1) along the alignment axis (2) in position (A) against the mount and adjust the mount vertically by adjusting the nuts on two screws (B).
⇨Hold the level in position (C) against the mount and adjust the mount vertically by adjusting the nuts on two screws (D).
⇨After leveling the mount, tighten all nuts.

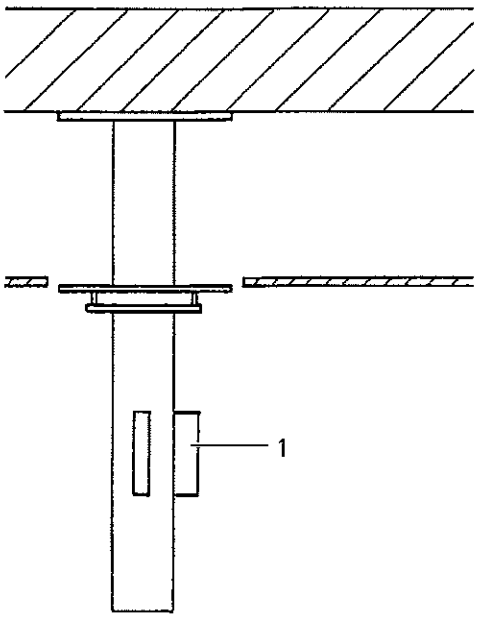


Figure 1

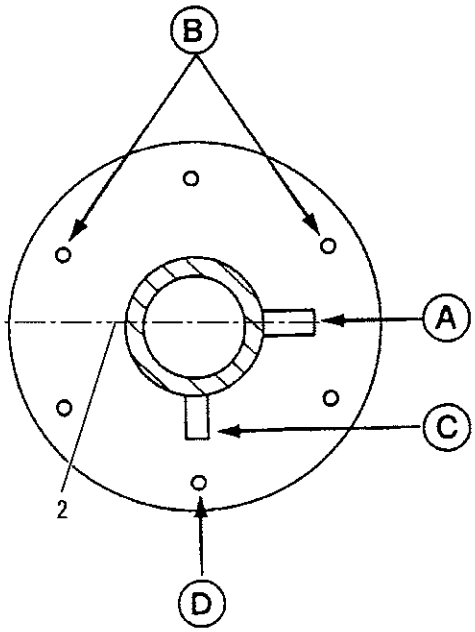


Figure 2

Installing the cover

⇨Separate the cover by removing the six screws.
⇨Reassemble the cover on the mount.
⇨Press the cover against the ceiling using the ring and tighten the ring in place using three screws.

Assembling the swinging arm onto the Leica Mini Mount

⚠ **Caution**
Screws can loosen!
⇨When assembling the distance rings and the swinging arm, never use anything but the Loctite-treated screws provided.

⇨Unscrew the insert (2) from the ceiling tube (1) (Figure 1).
⇨Insert the tensioning pieces (3) from above and screw them in place with insert (2) and spacer ring (5).
⇨Tighten six screws (4) to 14 Nm. Then loosen each individually and tighten to 10 Nm.
⇨Screw the insert (2) back into the ceiling tube with three screws.

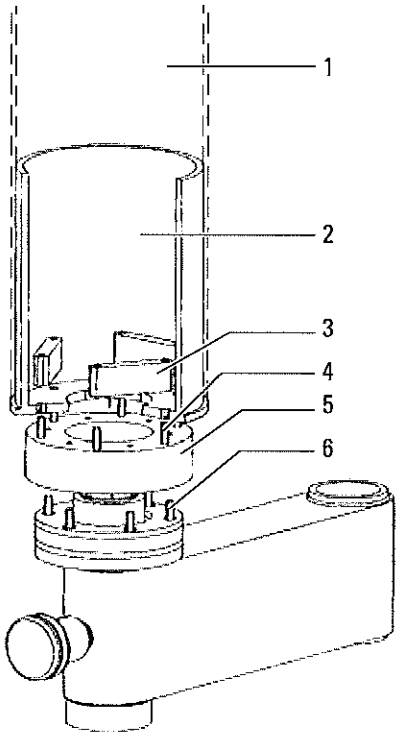


Figure 1

⇨Remove six adhesive strips (7) from the swinging arm and check whether spacer sleeves (9) are under them (Figure 2).

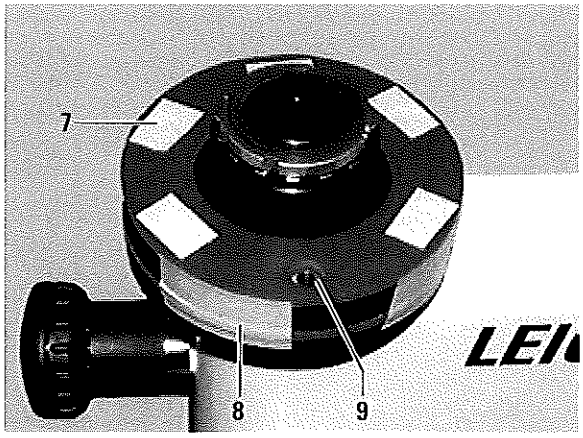


Figure 2

⚠ **Warning**
The swinging arm can loosen from the ceiling mount and cause serious injury.
⇨Tighten the screws sufficiently.
⇨Each time a screw is tightened, the weight of the swinging arm must be shifted to the opposite screw.

⇨Screw the swinging arm to the spacer ring (5) using the screws (6) (to a torque of 10 Nm).
⇨Remove the adhesive tape (8) from the side of the swinging arm.

⚠ **Caution**
Electrical cables can become severed!
Assembling the ceiling mount without a rotational lock device allows rotation of more than 360°.
⇨Install the rotational lock device.

⇨Attach the rotational lock device (10) to the ceiling tube (1) and to the clamping knob (11) of the swinging arm (Figure 3).

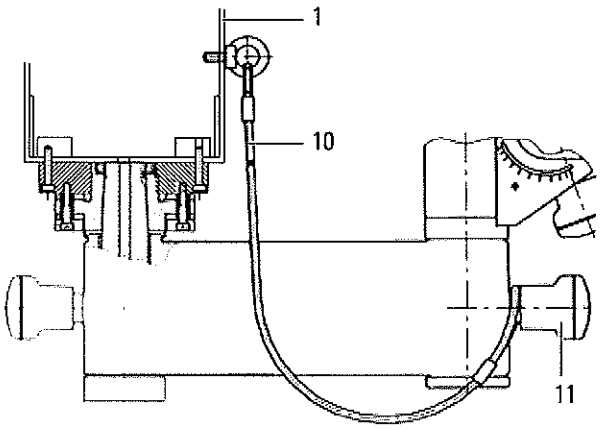


Figure 3

Control unit/lamp housing

To avoid damaging the rotary knobs, never unscrew the back panel of the control unit/lamp housing when it is in a lying position.

⇨Unscrew the back panel (2) of the control unit (Figure 1).

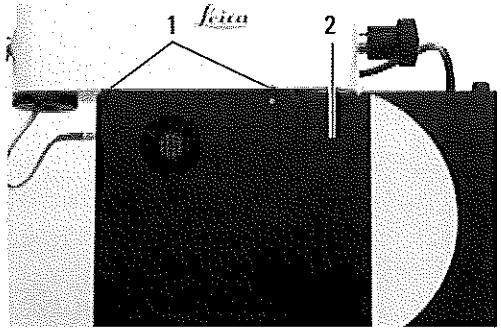


Figure 1

⇨Push the control unit onto the dovetail guide (1) on the swinging arm.
⇨Screw the control unit onto the dovetail guide using four screws (3) (Figure 2).

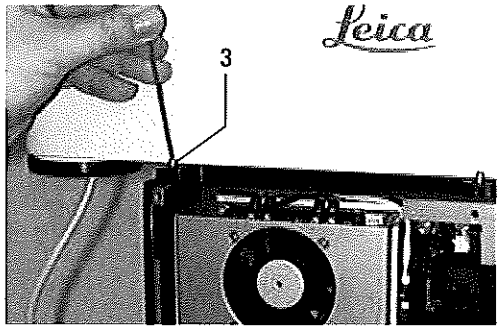


Figure 2

Connecting the control unit

Warning
Danger of fatal electrical shock!
⇨Electrical connections should only be performed by trained electricians.

⇨Feed the power cable (5) through the cover plate (6) and the shaft of the swinging arm and connect it to the power cable (4) that has been fed through the ceiling mount using a power plug or a clamping terminal (Figure 3).

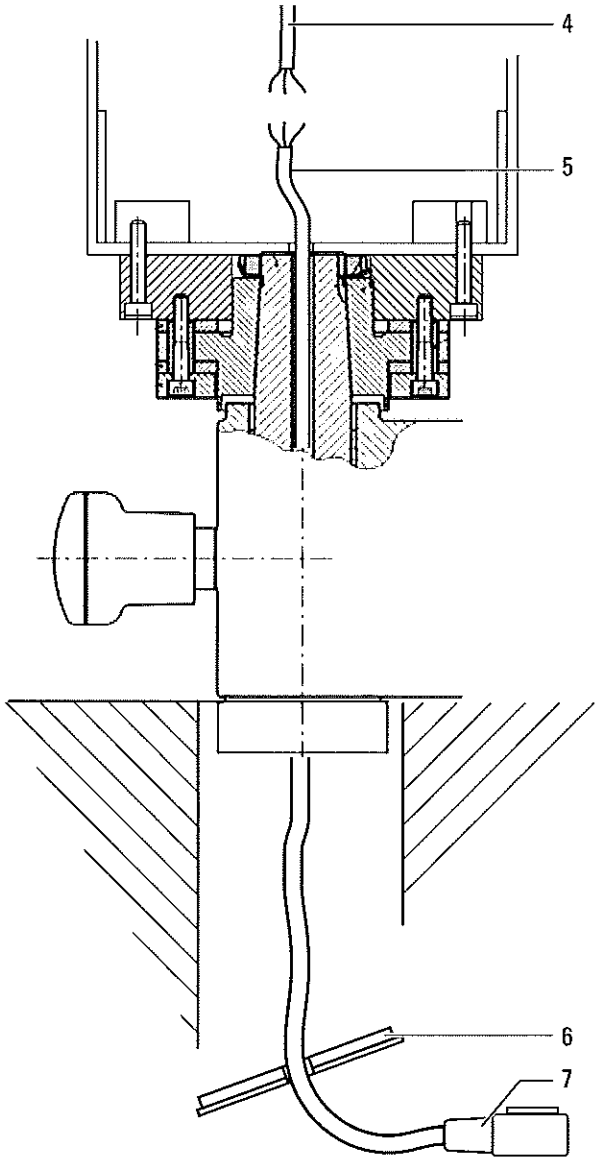


Figure 3

⇨Screw the back panel (2) of the control unit back on.
⇨Plug the fiber-optic light guide (8), CAN-bus cable (9) and power plug (7) into the control unit/lamp housing (Figure 4).
⇨Press the cover plate (6) into place.

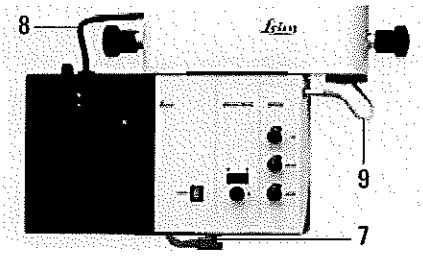


Figure 4

XY-unit (optional)

Attach the XY-unit to the tilt head

☞ Pay attention to the installation position of the XY-unit relative to the tilt head. The socket (2) on the XY-unit for the CAN-bus plug must be positioned as illustrated in Figure 1 relative to the tilt head (3).

⇨Screw the XY-unit to the tilt head (3) using three screws (1) (Figure 1).

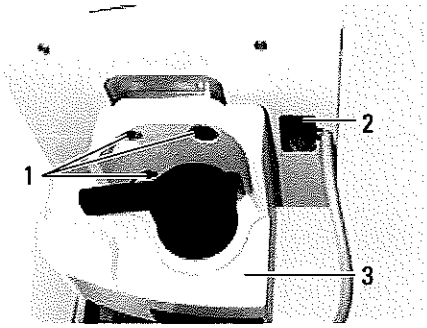


Figure 1

Attach the XY-unit with the tilt head to the rotatable joint

☞ Pay attention to the installation position of the XY-unit relative to the rotatable joint. The arrows (Figure 2) must be positioned on the same side.

⇨Fasten the XY-unit and tilt head to the rotatable joint using four screws (4) (Figure 2).

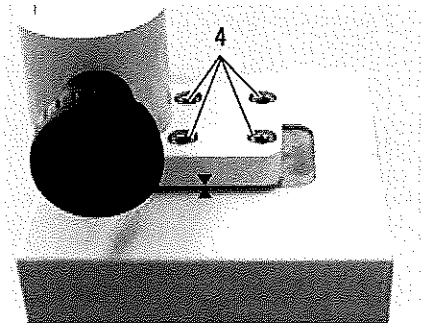


Figure 2

☞ Pay attention to the installation position (Figure 3).

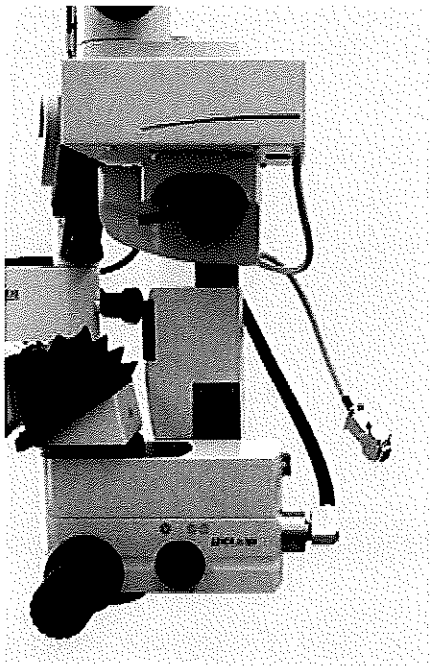
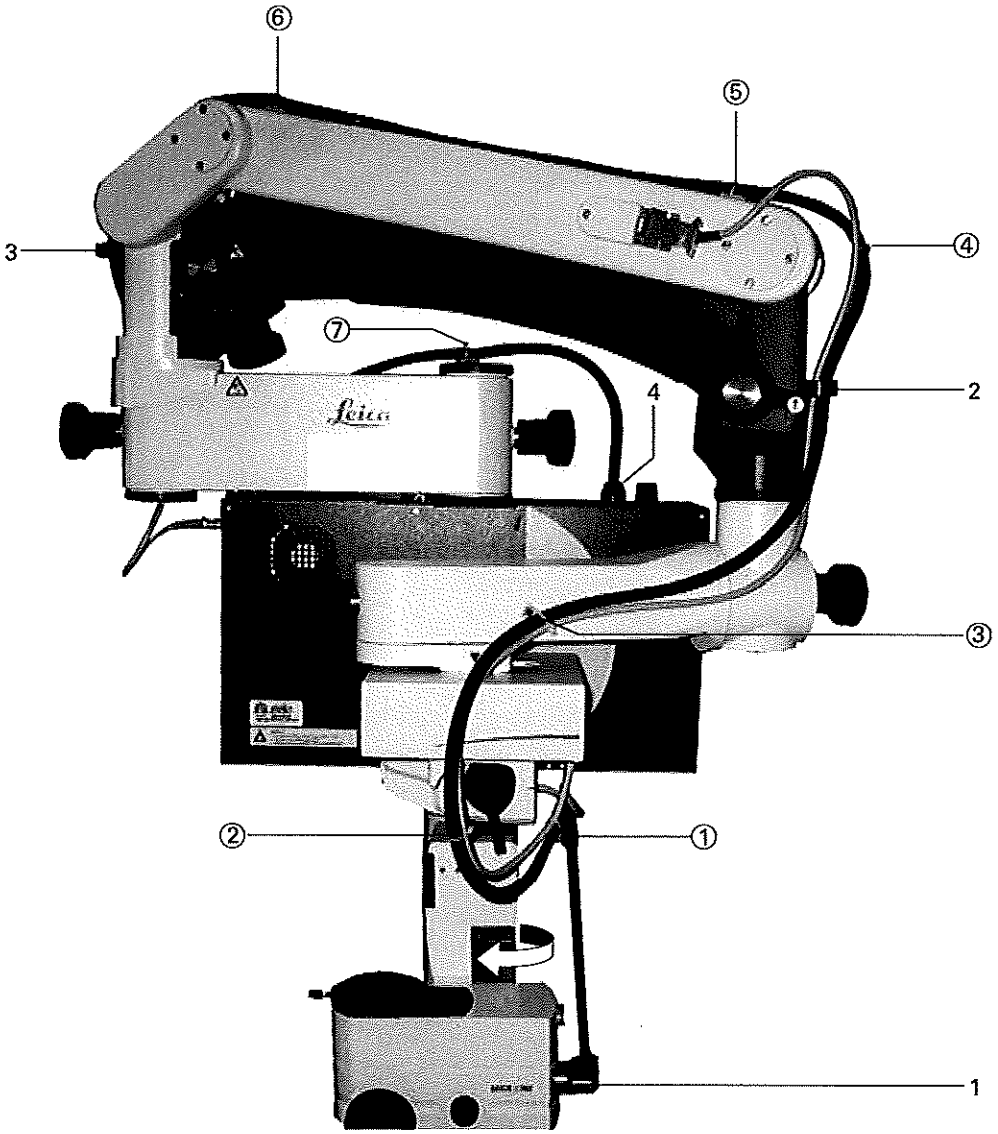


Figure 3

Cabling

⇨Turn the XY-unit clockwise as far as it will go.
⇨Insert the fiber-optic light guide in the optics carrier (1).
⇨Affix the fiber-optic light guide and CAN-bus cable using cable ties in the order ① to ⑥.
⇨Hang the fiber-optic light guide and CAN-bus cable into the cable holders (2).
⇨Feed the fiber-optic light guide through the guide (3) and attach it to the red position at ⑦ using the cable tie provided.
⇨Insert the fiber-optic light guide into the control unit (4).



⇨Insert the CAN-bus plug (1) into the XY-unit (optional) (Figure 1).

Checking the movement of the microscope

⇨Hold the microscope by the handles (2) and carefully turn it in the direction indicated by the arrow until it stops (Figures 1 and 2).
Make sure the fiber-optic light guide and the CAN-bus cable have sufficient play.

If necessary:

⇨Loosen the cable, increase the size of the loop and reattach the cable using cable ties.

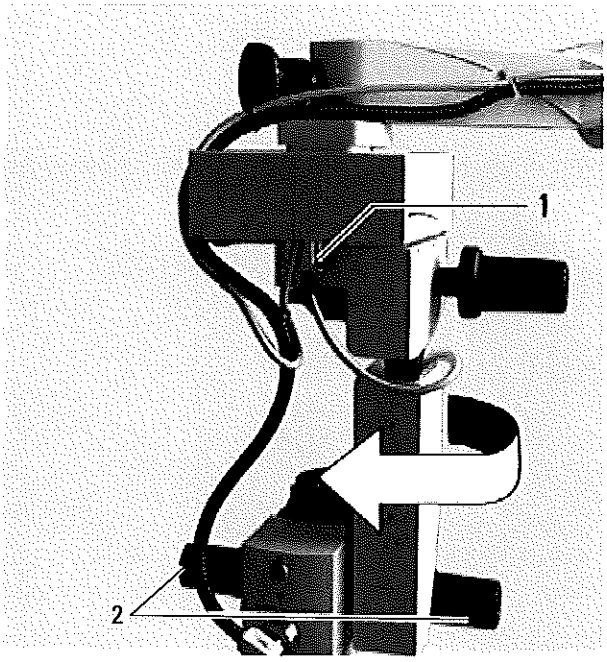


Figure 1

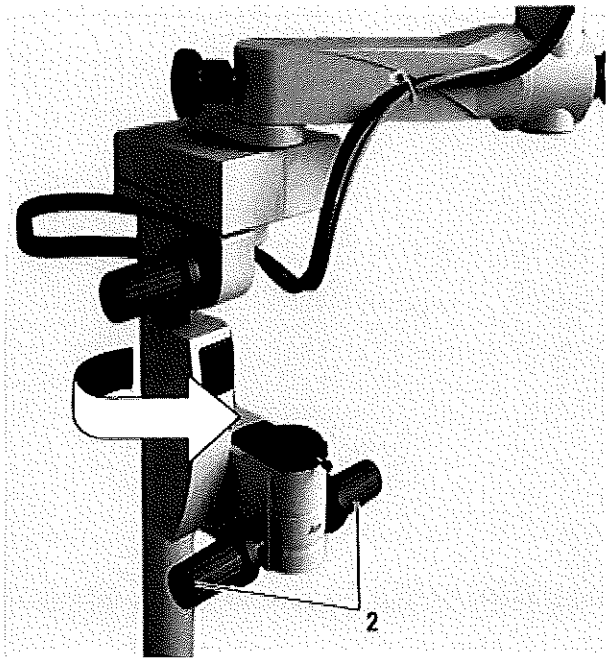


Figure 2

Disassembly

⇨Disassemble the Leica M501 surgical microscope in the opposite order in which it was assembled.

Starting up

Preparatory work

⇨Check for correct seating of all parts.
⇨Connect the Leica M501 surgical microscope to the power supply and switch on the power switch (4) (Figure 1).
⇨Balance the swinging arm (refer to the User Manual for the Leica M501 surgical microscope).

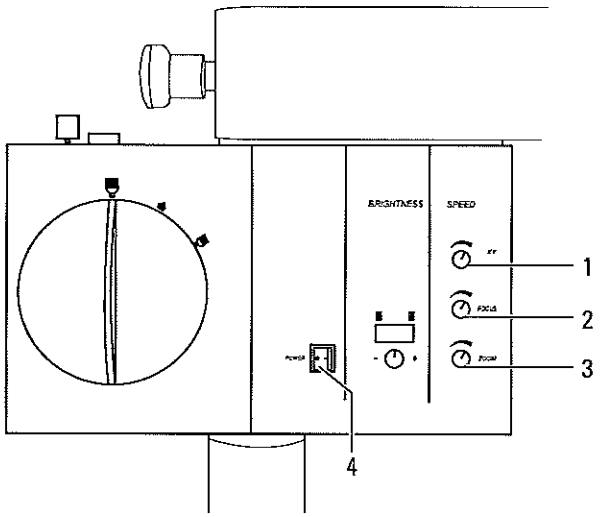


Figure 1

Checking components and functions

Zoom, focus and XY-unit (optional)

⇨Using the hand or footswitch, activate the zoom (7), focus (6) and XY-unit (5) (refer to the User Manual for the Leica M501 surgical microscope) (Figure 2).

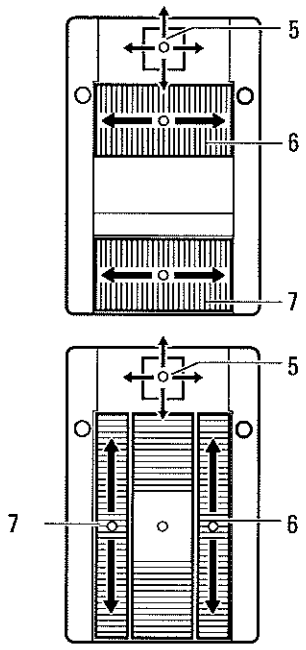


Figure 2

⇨Adjust the speeds for focus (2), zoom (3) and XY-unit (1) at the control unit/lamp housing (Figure 1).
⇨Switch the + and – movement directions of the XY-unit (refer to the User Manual for the Leica M501 surgical microscope).

If you cannot carry out a function:
⇨Check the plug connection of the hand or footswitch to the control unit/lamp housing.
⇨Check the plug connections of the CAN-bus cable at the control unit/lamp housing, the swinging arm and the XY-unit.

Illumination

⇨Adjust the brightness of the main illuminator using the regulating knob (1) (refer to the User Manual for the Leica M501 surgical microscope).
⇨Turn the quick-change lamp mount (2) to the "Auxiliary Lamp" position (refer to the User Manual for the Leica M501 surgical microscope).

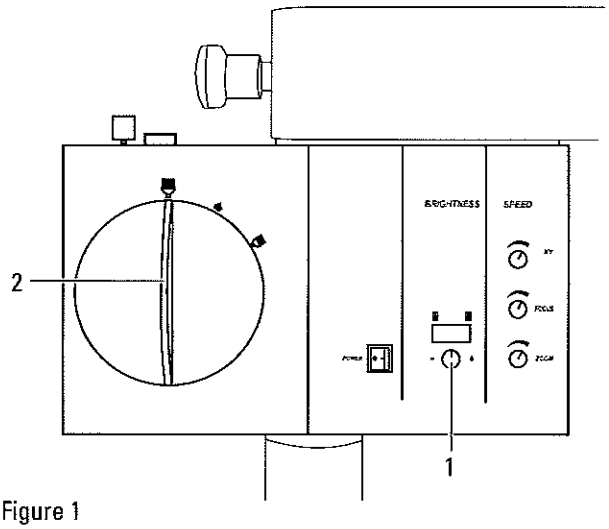


Figure 1

If you cannot carry out a function:
⇨Check whether the quick-change lamp mount is correctly locked into either the "Main Lamp" or "Auxiliary Lamp" position.
If necessary:
⇨Change bulbs.

Technical data

Ceiling specifications

Ceiling load capacity: at least 6000 N/m² *)
Concrete strength: at least 2000 N/m²
Strength class: at least B20

*) At a concrete strength of 2000 N/cm², a ceiling with a thickness of 160 mm yields a ceiling load capacity of 6000 N/m².

Warning
The telescope mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed in ceilings that do not meet the requirements in the specifications.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Weight

The total weight of the telescope mount and surgical microscope is 135 kg (static).

Warning
The telescope mount can loosen from the ceiling and cause serious injury.
The secure hold of the HILTI heavy load anchor is not guaranteed if additional weight is applied.
⇨Never hang any additional third-party products on the telescope mount.

Preparatory work

Prepare and arrange the tools listed below before you begin assembling the telescope mount.

Some tasks require two people.

Tools

Caution
⇨Tighten all screws without using excessive force.
⇨Set the torque spanner to the specified torque. When the set torque is achieved (i.e. when you hear a clicking sound), stop tightening.

- Drill hammer
- Drill bit ∅ 10 mm
- Drill bit ∅ 18 mm
- Ring spanner, SW 17 mm
- Ring spanner, SW 24 mm
- Torque spanner
- Socket head wrench
- Special socket wrench, article no. 430 415
- Hammer
- Spirit level

Assembly material

- Two HILTI segment anchors HSA M10 x 90
- Four HILTI heavy-load anchors HSL-3-B M12/25

Positioning recommendation

The recommended position of the Leica M501 Telescope Mount is above the center of the operating table, if possible in combination with the OP ceiling lighting.

Assembly

Fastening system

Warning
The telescope mount can loosen from the ceiling and cause serious injury.
Fastening systems that are not suited for this fastening type reduce the operational safety.
⇨Have an equivalent fastening system selected from an authorized technician.

The HILTI heavy-load anchor HSL-3-B for zones subject to tensile and pressure forces can be used for fastenings in normal concrete having a strength class of at least B20.

⇨Mark the guide holes (1) at the determined mount position (Figure 1).
⇨Drill the guide holes ∅ 10 mm and 100 mm deep.
⇨Clear the holes of drilling dust using a hand bellows.

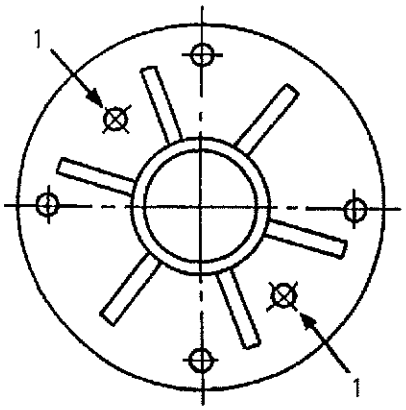


Figure 1

⇨Align the mounting bracket over the holes.
⇨Push the HILTI segment anchor HSA M10 x 90 through the guide hole.
⇨Lightly tap the anchor into the hole using a hammer (Figure 2).

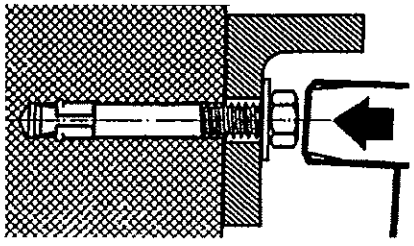


Figure 2

Place the nut flush to the end of the threading to protect the threading while tapping the anchor in!

⇨Tighten the nut to spread and brace the anchor (Figure 3).

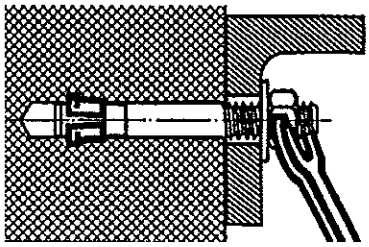


Figure 3

⇨Install the second auxiliary fastener.

Final assembly with HILTI heavy-load anchor HSL-3-B M12/25

The HILTI heavy-load anchor HSL-3-B can be used for fastenings in reinforced and non-reinforced concrete having a strength class of at least B20.

The HILTI heavy-load anchor HSL-3-B is a mechanically braced steel anchor with optically controllable initial tension which can take immediate load.

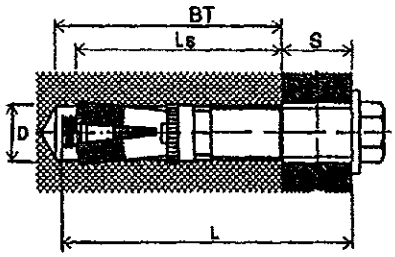


Figure 4

L = anchor length
Hd = hole depth
Id = insert depth
H = fastening height
D = hole ∅ = outer anchor ∅

There are three precision shear elements found in the red shear cap. Once the necessary torque has been applied using a standard ring spanner, the red hexagon cap shears off. The green filling that is uncovered and now visible on the screw head indicates that you have reached the necessary tension and the anchor will now carry the permissible load.

Installation data for HILTI heavy-load anchor HSL-3-B M12/25 in mm

D	hole ∅ = outer anchor ∅:	18
$H_{max.}$	max. fastening heights:	25
Hd	hole depth:	120
L	anchor length:	137
SW	shear cap spanner width:	24

⇨Drill hole ∅ 18 mm and 120 mm deep (Figure 1).

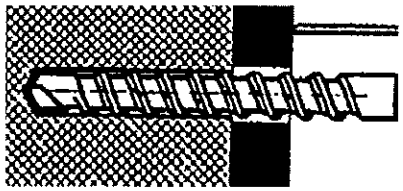


Figure 1

⇨Clear the holes of drilling dust using a hand bellows (Figure 2).

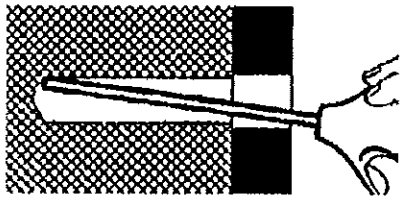


Figure 2

⇨Lightly tap the anchor into the hole flush to the plate using a hammer (Figure 3).

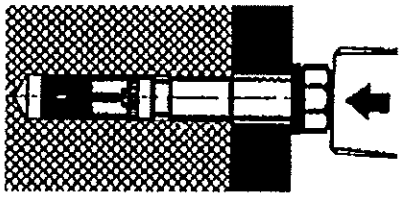


Figure 3

☞ The anchor sleeve splits suddenly!

⇨Tighten using a ring spanner until the red shear cap shears off.
The anchor is now tensioned with the necessary torque (Figure 4).

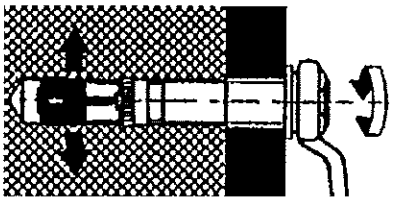


Figure 4

☞ Do not damage the green filling (1).

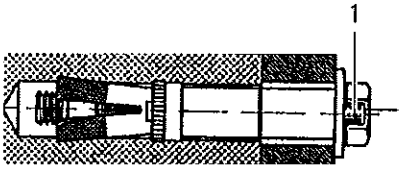


Figure 5

Green filling (1) is not damaged: the anchor can carry the permissible loads.
Green filling (2) is damaged: contact a HILTI representative immediately.

Mounting bracket assembly

Warning
The telescope mount can loosen from the ceiling and cause serious injury.
Completely separating the reinforcements hooks weakens the concrete ceiling.
⇨Be sure to call in an authorized technician to assess the load capacity of the concrete ceiling.

Warning
Coming in contact with the telescope mount can cause bodily injury.
Faulty electrical installations provided by the customer decrease operational safety.
⇨Electrical installations provided by the customer must meet all current local country regulations.

⇨Install the mounting bracket as illustrated in Figures 1 to 3.

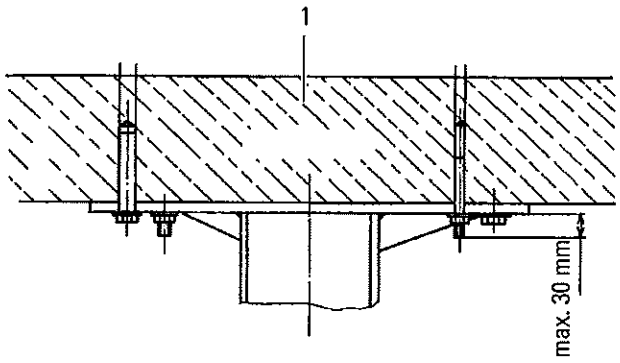


Figure 1

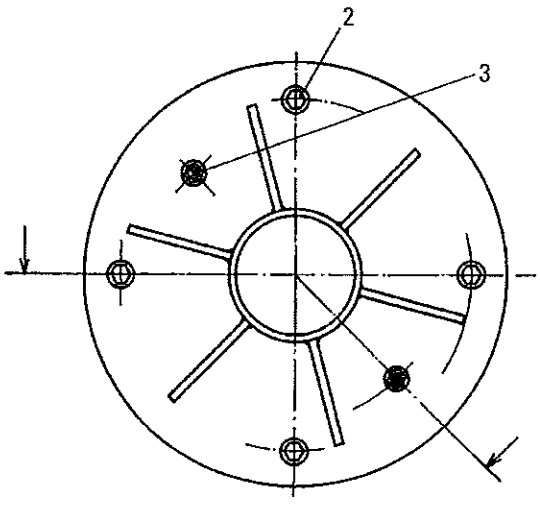


Figure 2

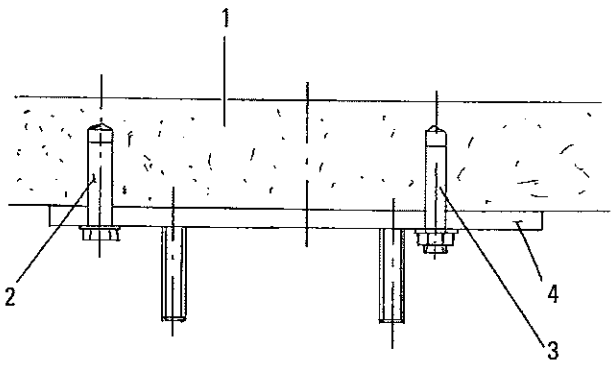


Figure 3

1 Concrete ceiling
2 HILTI heavy-load anchors HSL-3-B M12/25
3 HILTI segment anchor HSA M10 x 90
4 Ceiling plate

Installing the Leica Telescope Mount onto the mounting bracket

Depending on the ceiling height, the Leica Telescope Mount (3) is supplied with or without extension (2). The assembly is carried out from the plate (1), which is attached either to the extension (2) or to the Leica Telescope Mount (3) depending on the scope of delivery.

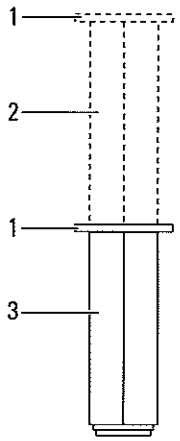


Figure 1

Detail A (Figs. 2 and 3):
⇨Install six screws (A) with cup springs (B) and nuts (C) on the mounting bracket (1).
⇨Screw on six nuts (D).
Leave a gap of about 20 mm.
⇨Fasten the telescope mount (3) or the extension (2) to the mounting bracket (4) using six cup springs (E) and (F) and six nuts (G).
The torque of nuts C, D and G is 60 Nm.

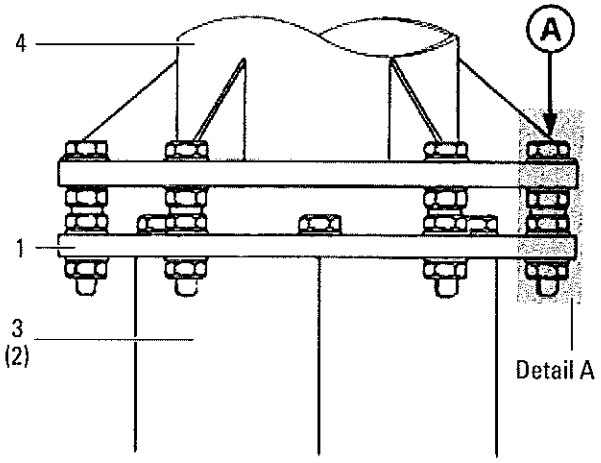


Figure 2

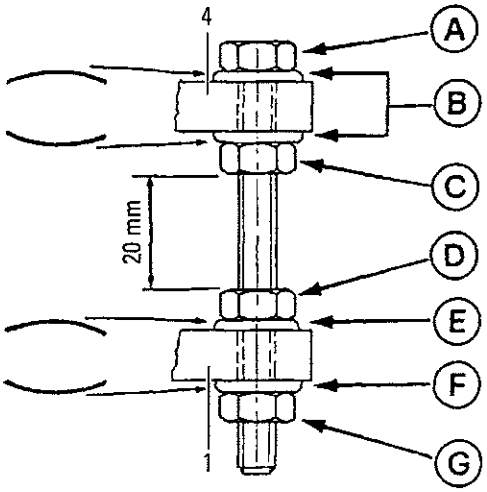


Figure 3 (Detail A)

Installing the Leica Telescope Mount onto the ceiling plate

Detail B (Figs. 4 and 5):
⇨Screw on six nuts (D).
Leave a gap of about 20 mm.
⇨Fasten the telescope mount (3) or the extension (2) to the ceiling plate (5) using six cup springs (E) and (F) and six nuts (G).
The torque of nuts D and G is 60 Nm.

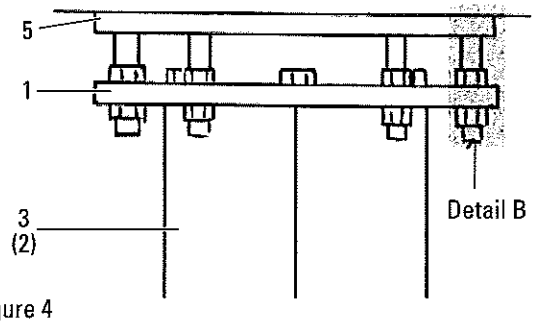


Figure 4

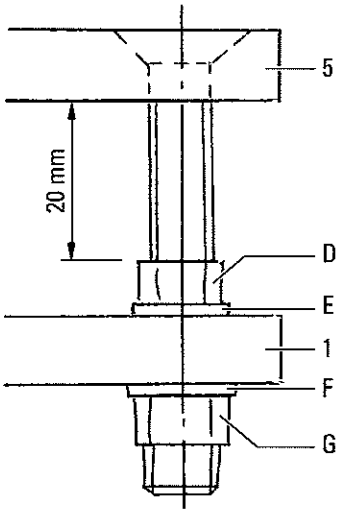


Figure 5 (Detail B)

Placing the Leica Telescope Mount vertically

The alignment axis (1) is the theoretical line connecting the axis of the telescope (2) with the patient head. The telescope must be installed so that the thread for the protective tube fastener (3) is always at 90° to the main direction and the plug for the remote control (4) is located on the side turned away from the patient (see sketch of Figure 1).

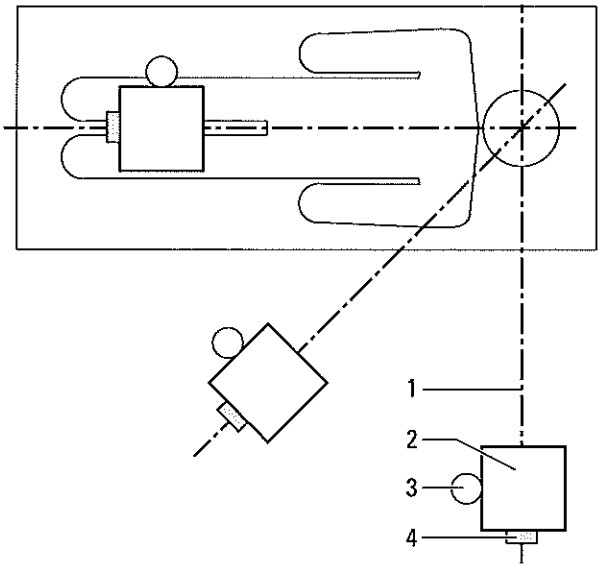


Figure 1

⇨Hold a level (5) along the alignment axis (1) in position (A) against the mount and adjust the mount vertically by adjusting the nuts on two screws (B) (Figures 2 and 3).
⇨Hold the level in position (C) against the mount and adjust the mount vertically by adjusting the nuts on two screws (D).
⇨After leveling the mount, tighten all nuts.

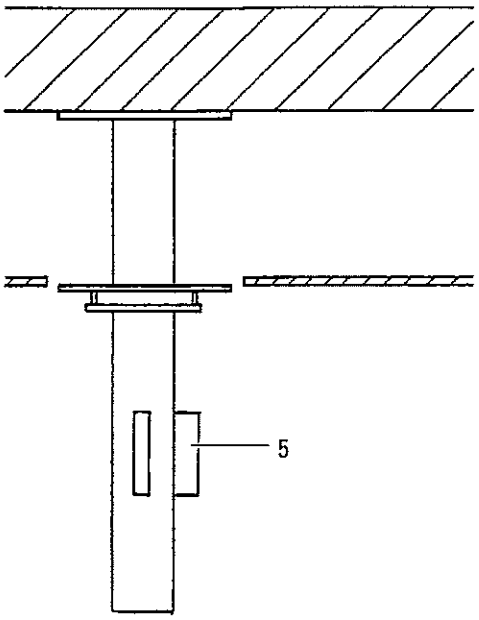


Figure 2

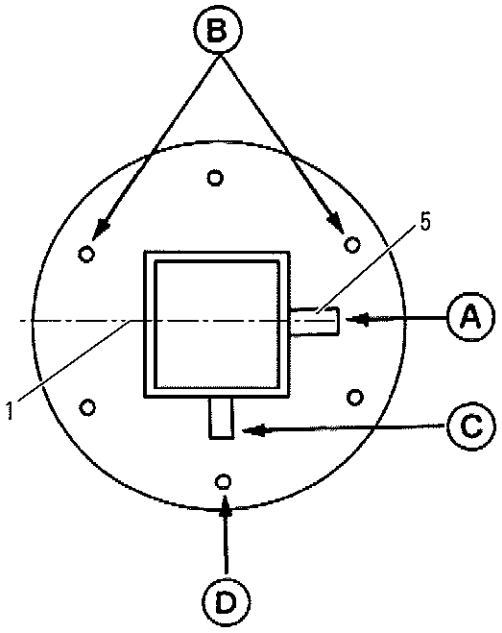


Figure 3

Adjustable stops

To protect the cables against cable breakage when the telescope is rotating, two stop screws (2) were installed at the stop flange (1) at the factory. The stop screws can separately be moved.

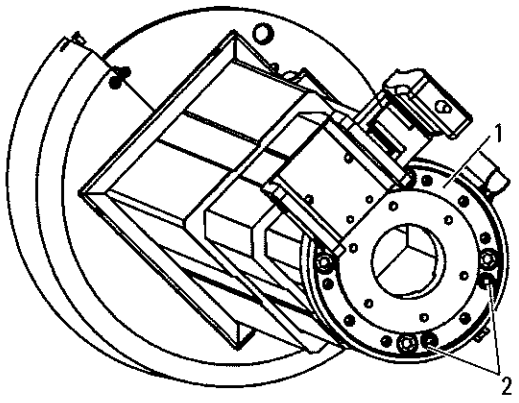


Figure 1

Assembling the swinging arm onto the Leica Telescope Mount

⇨Remove six adhesive strips (3) from the swinging arm and check whether spacer sleeves (4) are under them.
⇨Feed the power cable from the Leica Telescope Mount through the shaft of the swinging arm.

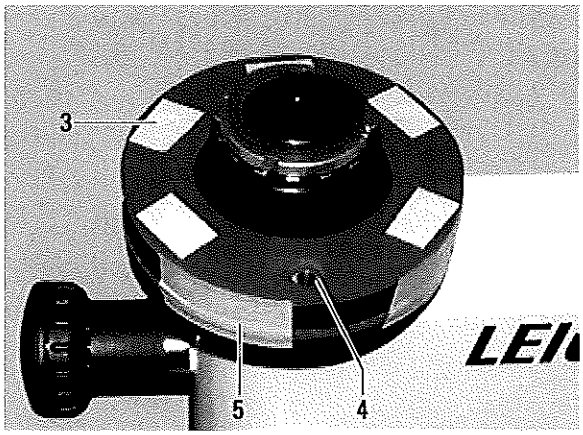


Figure 2

Warning
The swinging arm can loosen from the telescope mount and cause serious injury.
⇨Tighten the screws sufficiently.
⇨Each time a screw is tightened, the weight of the swinging arm must be shifted to the opposite screw.

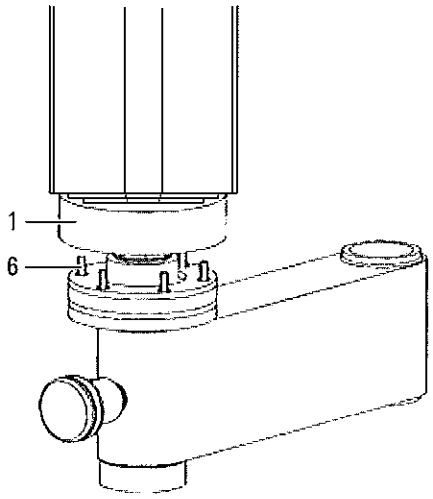


Figure 3

⇨Screw the swinging arm to the spacer ring (1) using the screws (6) (to a torque of 10 Nm) (Figure 3).
⇨Remove the lateral adhesive tape (5) from the swinging arm (Figure 2).

Caution
Electrical cables can become severed!
Assembling the Leica Telescope Mount without a rotational lock device allows rotation of more than 360°.
⇨Install the rotational lock device.

⇨Push the stop (1) tilted under the stop flange and secure it with three screws (2).

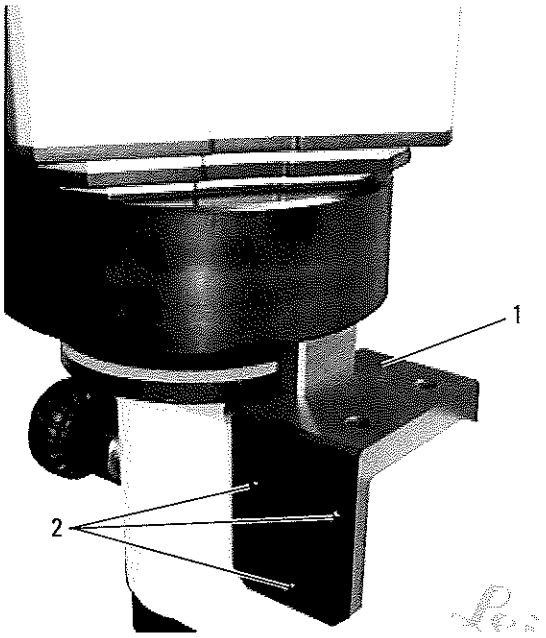


Figure 1

The stop (1) must be mounted so that the swinging arm is freely movable in the working range.

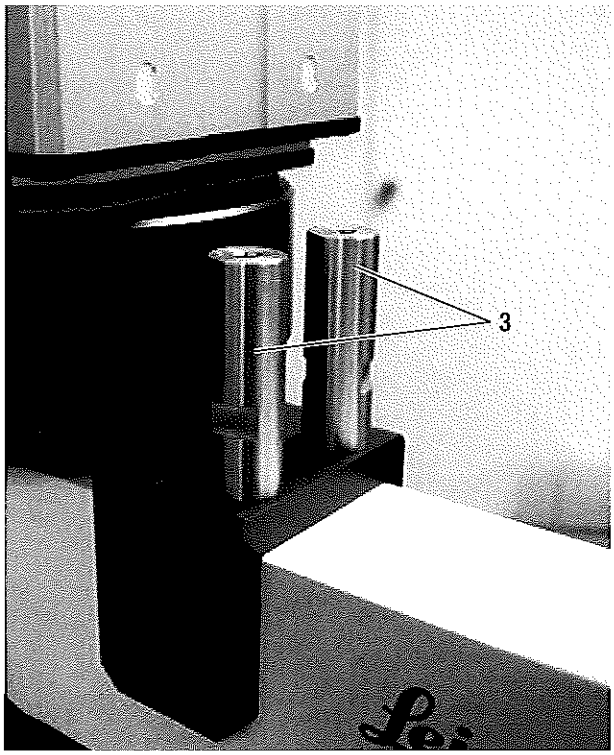


Figure 2

⇨Screw two spacing bolts (3) into the stop.

Installing the control unit support

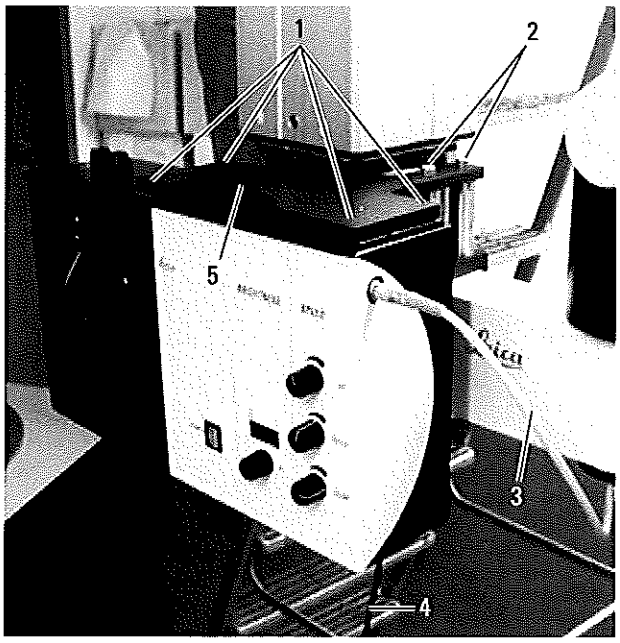


Figure 1

⇨Fasten the control unit support (5) with two screws (2).
⇨Move the control unit underneath the control unit support and fasten it with four screws (1).

Connecting the control unit

Warning
Danger of fatal electrical shock!
⇨Electrical connections should only be performed by trained electricians.

⇨Install the power plug on the connecting cable (4).
Neutral conductor = blue lead wire
Phase = brown lead wire
Protective ground = green-yellow lead wire
⇨Insert the power plug into the power socket at the bottom of the control unit.
⇨Insert the fiber-optic light guide and CAN-bus cable (3) into the control unit.
⇨Insert the plug of the remote control into the outer flange.
⇨Establish the electrical connection at the ceiling to the Leica Telescope Mount.

Establishing the electrical connection

Warning
Danger of fatal electrical shock!
⇨Electrical connections should only be performed by trained electricians.

⇨Perform the cable wiring at the ceiling according to Figure 2.
Fuse (6): T6.3 A max.

The lead wire diameter must measure at least 1.5 mm^2 for the connection on the building side.

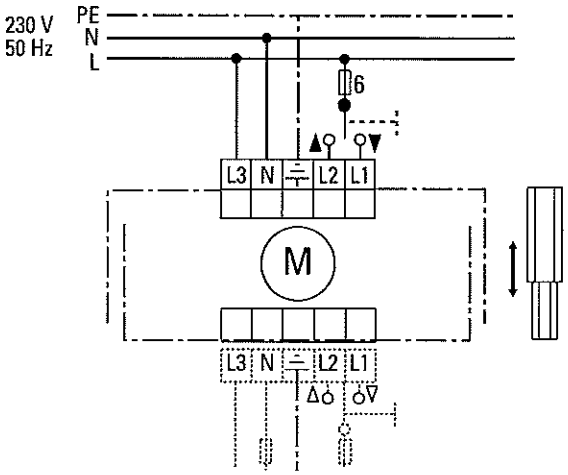


Figure 2

Installing the protective tube for external cables

External cables (e.g. video, cable of control unit at the wall) are fed through the supplier protective tube.

⚠ **Caution**
Possible damages to the telescope!
⇨Use only the supplied screws M3 x 5 to secure the hose coupling support.

☞ For a telescope without extension, mount three hose coupling supports, for a telescope with extension four hose coupling supports.

⇨Fasten hose coupling supports with M3 x 5 screws. For locations, see Figure 1.

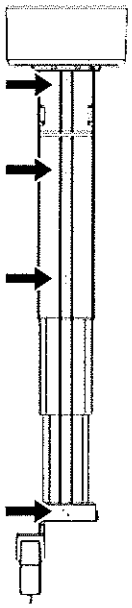


Figure 1

⇨Cut the supplied protective tube to a length of 130 cm (without extension). If an extension is used, adjust the tube length accordingly.

⇨Place the bunched cables in the special tool for shrouding (Figure 2).

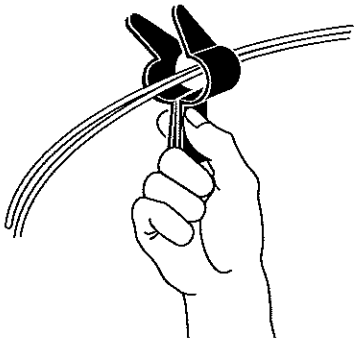


Figure 2

⇨Fit the protective tube onto the tool (Figure 3).

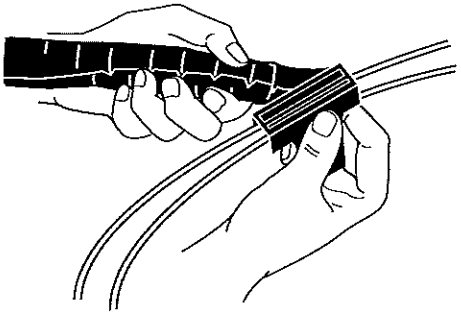


Figure 3

⇨Pull the special tool over the cables while mounting the protective tube over the cables (Figure 4).

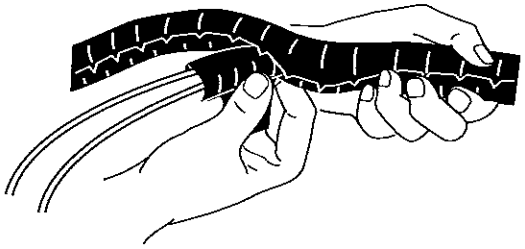


Figure 4

⇨Secure the protective tube at one end against moving by using a cable tie.

➪Attach the protective tube (1) to the telescope (Figure 1).

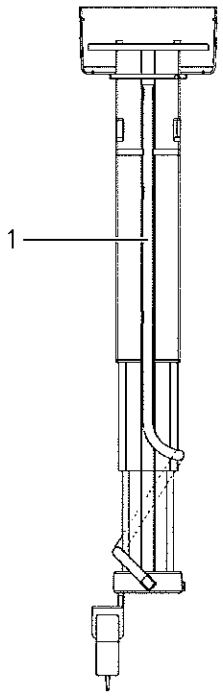


Figure 1

Installing the cover

➪Place both cover sides around the telescope and screw them together.

☞ The cutout (2) is used for routing the cable through and is located above the output of the protective tube (see top view in Figure 2).

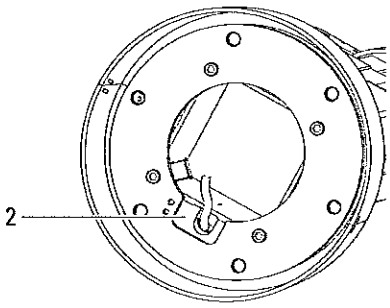


Figure 2

➪Install four clamping beads (4) under the cover (3) and fasten lightly.

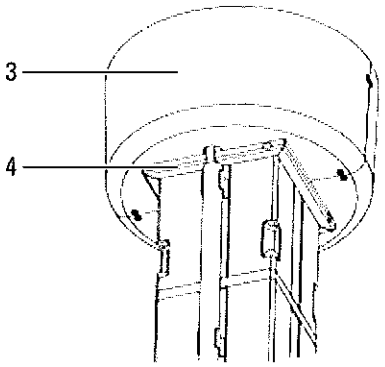


Figure 3

☞ The clamping bead (4) overlaps the cable opening in the cover if no external cables are routed through the protective tube (see Figure 4).

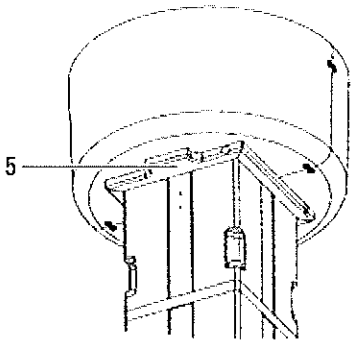


Figure 4

➪Move the cover (3) and the four clamping beads (4) completely to the top and tighten them.

XY-unit (optional)

Attach the XY-unit to the tilt head

☞ Pay attention to the installation position of the XY-unit relative to the tilt head. The socket (2) on the XY-unit for the CAN-bus plug must be positioned as illustrated in Figure 1 relative to the tilt head (3).

⇨Screw the XY-unit to the tilt head (3) using three screws (1) (Figure 1).

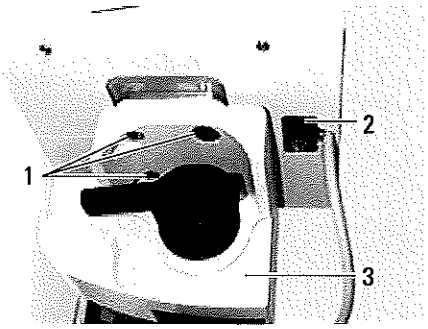


Figure 1

Attach the XY-unit with the tilt head to the rotatable joint

☞ Pay attention to the installation position of the XY-unit relative to the rotatable joint. The arrows (Figure 2) must be positioned on the same side.

⇨Fasten the XY-unit and tilt head to the rotatable joint using four screws (4) (Figure 2).

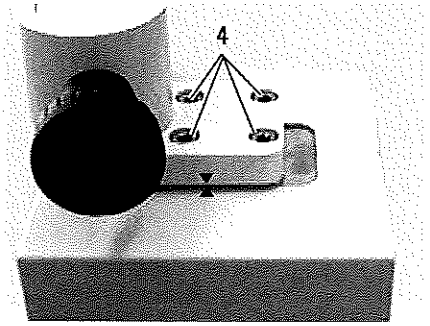


Figure 2

☞ Pay attention to the installation position (Figure 3).

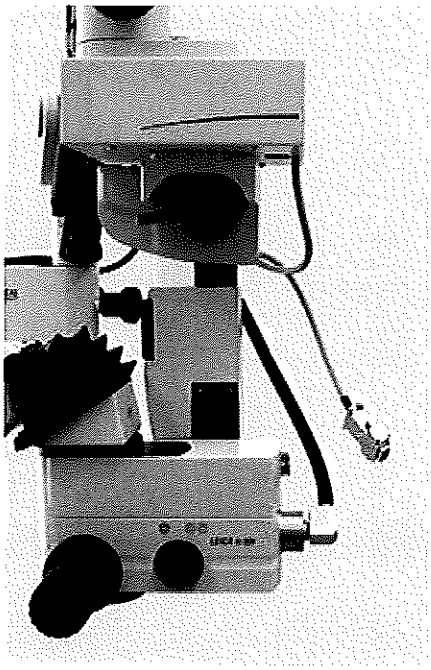
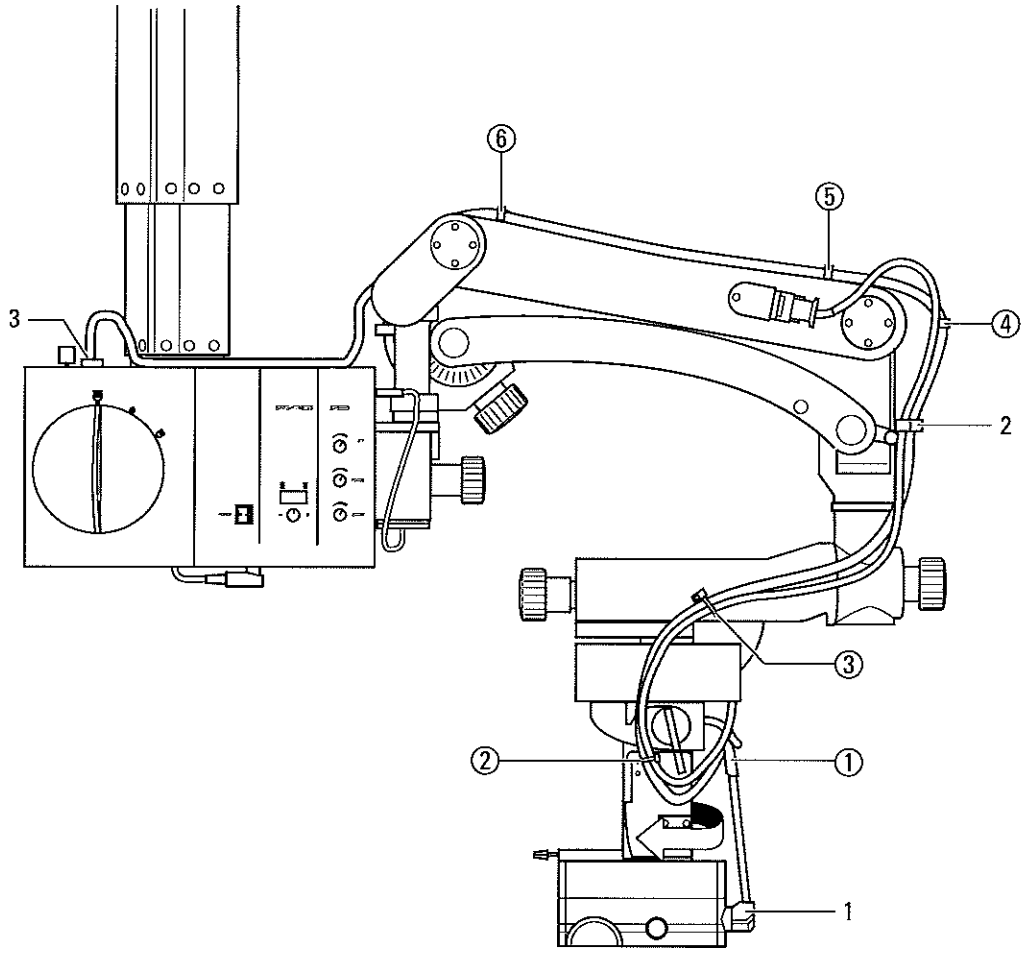


Figure 3

Cabling

⇨Turn the XY-unit clockwise as far as it will go.
⇨Position the fiber-optic light guide in the optics carrier (1).
⇨Affix the fiber-optic light guide and CAN-bus cable using cable ties in the order ① to ⑥.
⇨Hang the fiber-optic light guide and CAN-bus cable into the cable holders (2).
⇨Insert the fiber-optic light guide into the control unit (3).



⇨Insert the CAN-bus plug (1) into the XY-unit (optional) (Figure 1).

Checking the movement of the microscope

⇨Hold the microscope by the handles (2) and carefully turn it in the direction indicated by the arrow until it stops (Figures 1 and 2).
Make sure the fiber-optic light guide and the CAN-bus cable have sufficient play.

If necessary:

⇨Loosen the cable, increase the size of the loop and reattach the cable using cable ties.

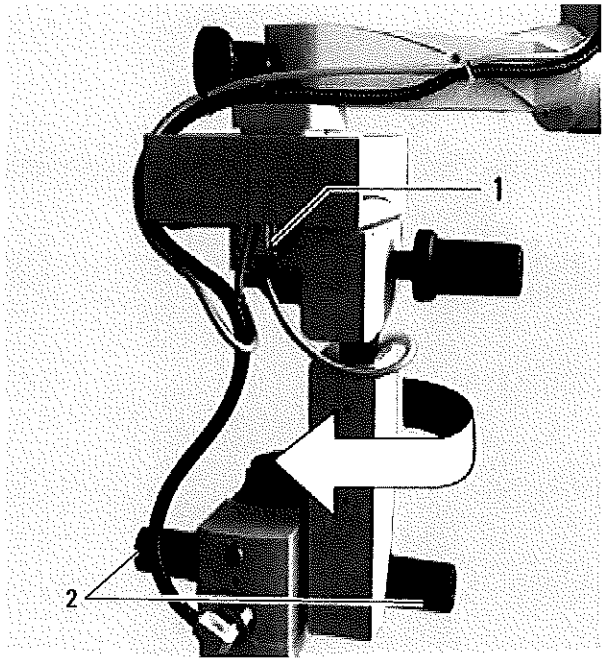


Figure 1

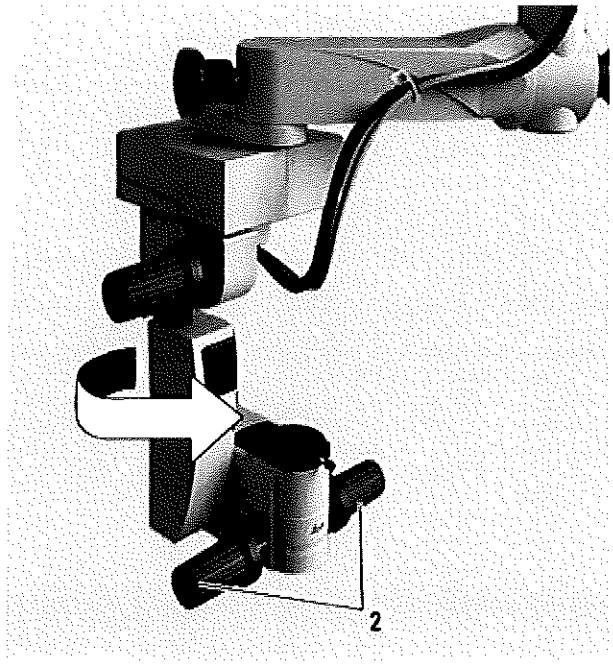


Figure 2

Disassembly

The Leica M501 surgical microscope is disassembled in the opposite order in which it was assembled.

Starting up

Preparatory work

⇨Check for correct seating of all parts.
⇨Connect the Leica M501 surgical microscope to the power supply and switch on the power switch (4) (Figure 1).
⇨Balance the swinging arm (refer to the User Manual for the Leica M501 surgical microscope).

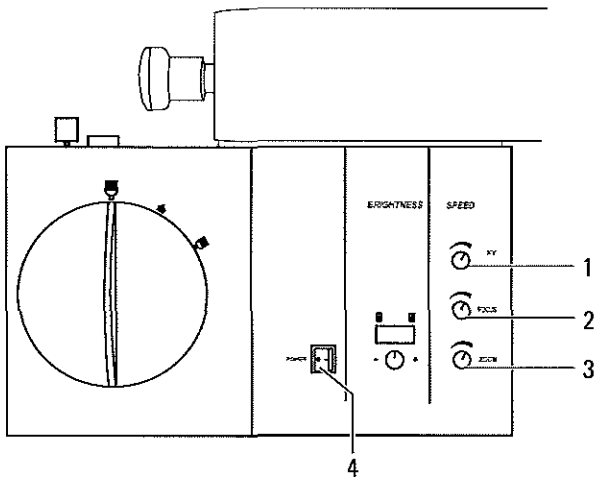


Figure 1

Checking components and functions

Zoom, focus and XY-unit (optional)

⇨Using the hand or footswitch, activate the zoom (7), focus (6) and XY-unit (5) (refer to the User Manual for the Leica M501 surgical microscope) (Figure 1).

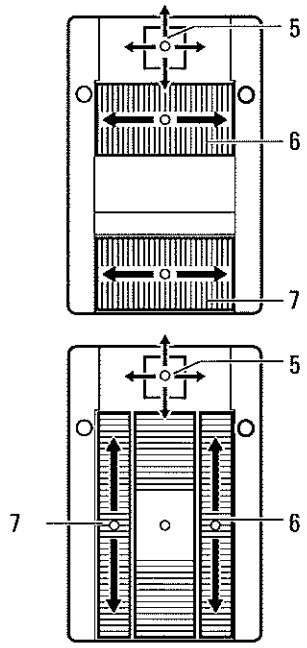


Figure 1

⇨Adjust the speeds for focus (2), zoom (3) and XY-unit (1) at the control unit/lamp housing (Figure 1).
⇨Switch the + and – movement directions of the XY-unit (refer to the User Manual for the Leica M501 surgical microscope).

If you cannot carry out a function:
⇨Check the plug connection of the hand or footswitch to the control unit/lamp housing.
⇨Check the plug connections of the CAN-bus cable at the control unit/lamp housing, the swinging arm and the XY-unit.

Illumination

⇨Adjust the brightness of the main illuminator using the regulating knob (1) (Figure 2) (refer to the User Manual for the Leica M501 surgical microscope).
⇨Turn the quick-change lamp mount (2) to the "Auxiliary Lamp" position (refer to the User Manual for the Leica M501 surgical microscope).

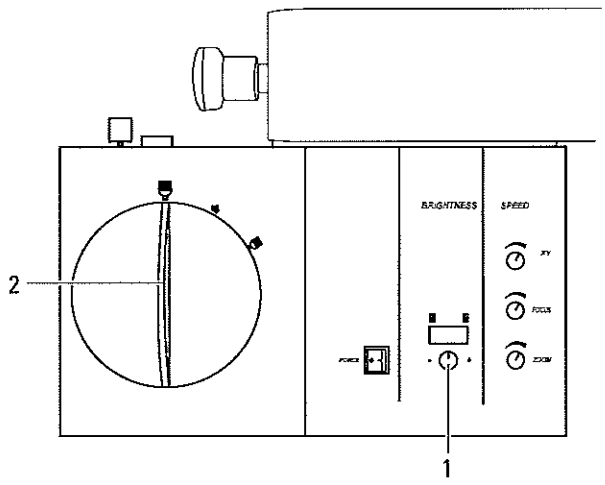


Figure 2

If you cannot carry out a function:
⇨Check whether the quick-change lamp mount is correctly locked into either the "Main Lamp" or "Auxiliary Lamp" position.
If necessary:
⇨Change bulbs.

Telescope stand

⇨Move the telescope stand up and down using the remote control.
⇨Move the swinging arm to both end positions and check for ease of motion and that the end positions are correct.

The verification and acceptance procedure is to be carried out by Leica service after assembly is complete and after servicing procedures.

The verification procedure determines:
- whether the technical safety requirements for the protection of patients and personnel have been met,
- whether the capability characteristics of the Leica M501 surgical microscope are fulfilled.

☞ The complete system may not be operated until acceptance is confirmed by Leica service.

This is followed by a personnel briefing.

Acceptance certificate for the Leica M501 surgical microscope

The fastening engineer hereby confirms that the auxiliary frame of the ceiling mount for:

Client's name and address

Field of specialty

has been attached in accordance with

❒ the requirements specified in these Installation Instructions for the auxiliary frame of the ceiling mount. *)

❒ the special instructions and strength assessment concerning the load capacity of the ceiling and/or specifications of the fastening system, thus observing all precautionary measures for ensuring the secure attachment of the Leica M501 surgical microscope. *)
The corresponding documentation is enclosed.

*) Check appropriate box accordingly

Fastening engineer in charge

Name

Address

Signature

Location Date

Representative of Leica Microsystems (Schweiz) AG

Name

Address

Noticed Signature

Location Date

A copy of this acceptance protocol, filled out by the fastening engineer in charge, is to be given to the client and one to the Leica representative.
Filing period: 20 years

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Semiconductor Equipment
Our automated, leading-edge measurement and inspection systems and our E-beam lithography systems make us the first choice supplier for semiconductor manufacturers all over the world.

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